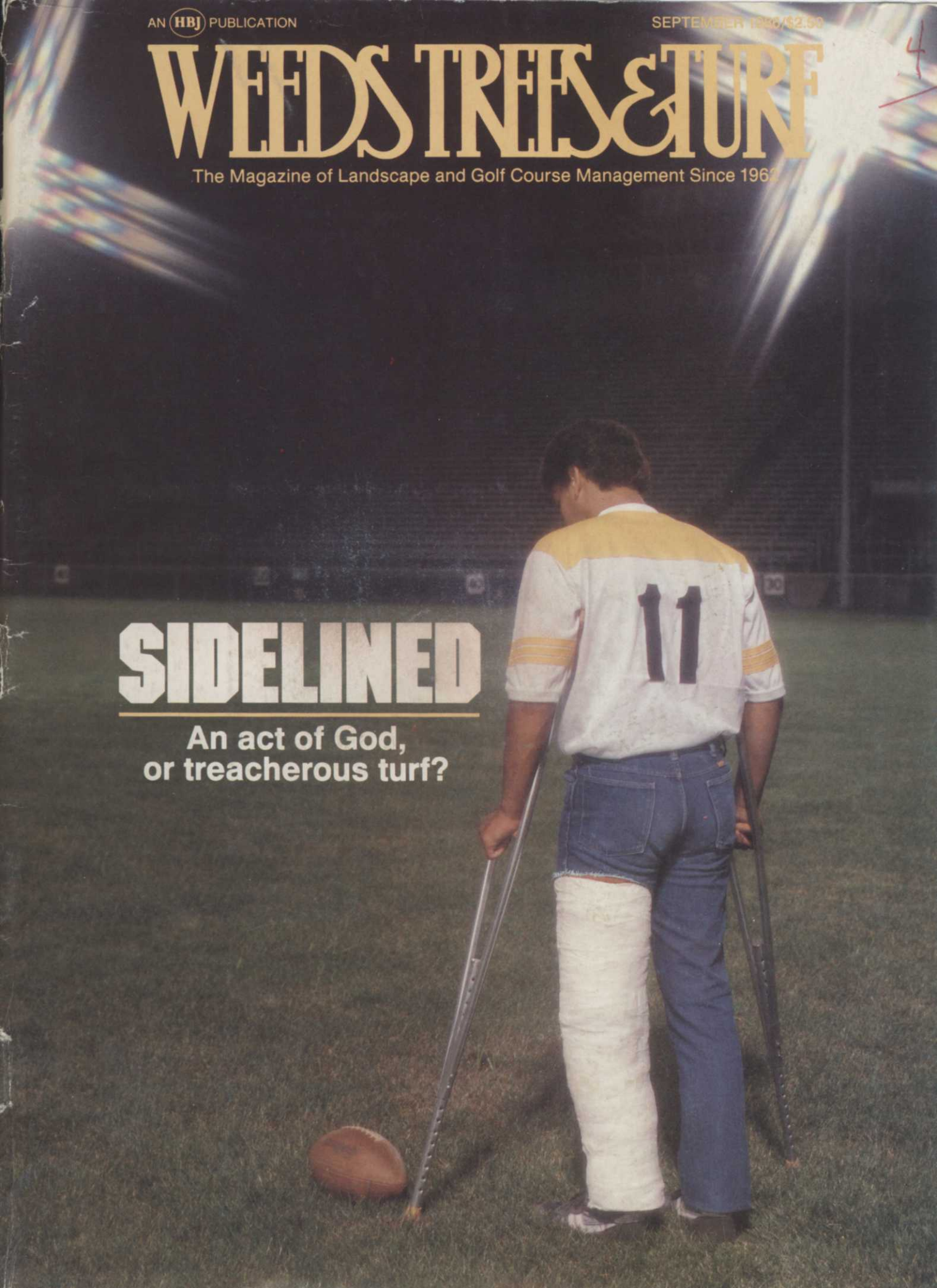
AN HBJ PUBLICATION

SEPTEMBER 1986/$2.50

WEEDS TREES & TURF

The Magazine of Landscape and Golf Course Management Since 1962



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Circle No. 117 on Reader Inquiry Card

SEPTEMBER 1986, VOLUME 25, NUMBER 4

WEEDS TREES & TURF

The Magazine of Landscape and Golf Course Management Since 1962

72

COVER STORIES: SAFER ATHLETIC FIELDS

WEEDS TREES & TURF takes an in-depth overview of quality control of turfgrass on athletic fields, hoping to provide tips to make your field safer for young athletes.

40 THE KILLING FIELD
50 AN ACT OF GOD?
56 FOR SAFER TURF . . .
58 ARE YOU LIABLE?
60 ONE WHEELCHAIR IS TOO MANY
62 PREVENTING, NOT PROMOTING, THE INJURY
64 FOR MORE INFORMATION . . .

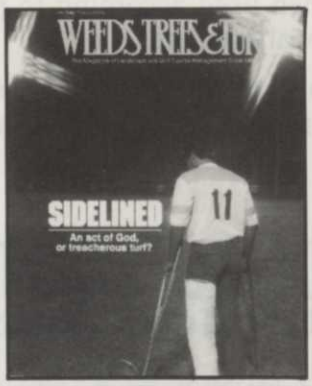
DEPARTMENTS

6 TRENDS
8 GREEN INDUSTRY NEWS
36 SHORTCUTS
135 PROBLEM SOLVERS
136 PRODUCTS
137 JOB TALK
138 CLASSIFIED
141 AD INDEX
142 OUTLOOK

67 HIGH SPEED
The ever-popular hydroseeding technique is a fast and economical method of seeding that can save you money. Here are the hows and whys.

72 1987 BUYER'S GUIDE
As you begin to get ready to purchase equipment, chemicals and seed for the 1987 season, you'll want to refer to the annual WEEDS TREES &TURF Buyer's Guide, 34 pages of jam-packed information.

9 ELANCO PRODUCTS COMPANY *Presents,*
A GUIDE TO LANDSCAPE MANAGEMENT



Cover photo of model Chuck Rezek by Bill Barker, Iann-Hutchins Studio, Cleveland.

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Groundsmaster 217-D

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And that includes detailed support information on specifications, options and features—all you need to know to justify cost-effective expenditures. If you need specialized parts, ask about Toro's Unit Down or Direct Ship Programs.

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Groundsmaster 117

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For more information on the Toro Groundsmaster advantage and the name of the distributor near you write to The Toro Company, Dept. GM, Commercial Marketing, 8111 Lyndale Ave. S., Minneapolis, MN 55420.

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NEWS/TRENDS

Good planning can make budget fight easier

■ The problem with many athletic turf managers is they don't do a good enough job selling themselves and, consequently, they aren't taken seriously when they place their supply orders on their superior's desk.

The reason they aren't taken seriously? Poor planning, according to Bill Bedrossian of Servicemaster Industries in Downers Grove, Ill. Bedrossian told his audience of athletic turf managers at the Midwest Sports Turf Institute they must "plan, execute, and review."

An athletic turf manager must document items such as manpower (total hours available versus total hours needed, scheduling, seasonal fluctuations), equipment (purchase date, condition, scheduled replacement, replacement cost), supplies (on hand, annual needs, cost effectiveness), and grounds (turf areas, paved surfaces, irrigation systems, trees and shrubs, bleachers).

An effective sports turf manager, says Bedrossian, has a planning calendar that includes items such as routine seasonal requirements, and regular annual events such as graduations, town fairs, and special sporting events. He also keeps a long-term calendar, perhaps a year in advance, of projects in the works.

Credibility is most important, he says, noting that written and photographed documentation is a must. "Show the superiors the condition of the fields when you started versus the condition they are in today," Bedrossian says.

And finally he says you must follow through by establishing expectations, providing inspections and documentations, making revisions when necessary, being flexible, and promoting yourself. Bedrossian says if you don't let anyone know you're doing a good job, your work will go unnoticed. And your budgeting battles will be losing ones.

Low-maintenance California grass on horizon

■ El Toro—not the tequila, but a low maintenance zoysiagrass expected to prosper in the warm California climate—should be available for home lawn, park, and other uses within two years, according to Dr. Vic Gibeault, cooperative extension turfgrass specialist at the University of California-Riverside.

El Toro, says Gibeault, is heat and salt tolerant, requires less water and nitrogen fertilizer than other turfgrasses, has few insect or disease problems, has good density and resistance to foot traffic, and grows in light to moderate shade.

It shows good cool season color but goes dormant during the cooler winter months, says Gibeault. He notes it produces less thatch than other zoysiagrasses.

El Toro is a UC-patented selection developed from the breeding program of the late UC-R professor Dr. Victor B. Younger.

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Circle No. 120 on Reader Inquiry Card

TECHNOLOGY

Robot lawnmower: just around the corner?

Dr. Ernest Hall spent years calling equipment companies trying to convince them to manufacture his robot lawn mower. This year, companies are calling him.

Hall, director of the Center for Robotics Research at the University of Cincinnati, has turned an 11-hp Snapper riding mower into a robot mower. Now, Snapper is among several companies vying to manufacture the space age mower.

"I'm negotiating with six companies," Hall says. "Snapper is the one I've talked to the longest and in the most detail."

But Hall also mentions Honda as a possible manufacturer. "It's a product that's been developed in America, but the Japanese may be more interested in manufacturing it," he says.

Hall describes another company looking into the mower as "a major corporation in the United States which works with race cars and challenging technological things."

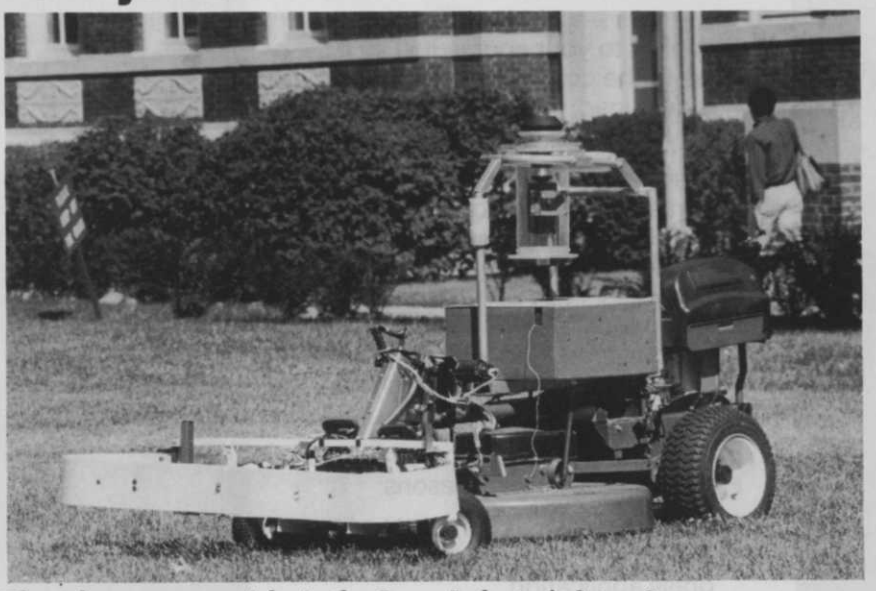
The mower could be ready to market in two or three years. "But the possible manufacturers have a lot of questions."

One new question, which seems to be choking many industries, is liability. Although, Hall says, the robot lawn mower is potentially safer than today's mowers, the issue cannot be ignored.

Already, people have won cases against mower manufacturers despite the fact that the consumer was misusing the product. In one case, someone was using a push mower as a hedge trimmer. In another, a man died of a heart attack trying to start a mower with a clogged system.

"If you were worried all the time, nobody would do anything," Hall says.

The mower is safer, primarily because it decreases human contact with the machine. Lawn mower accidents hurt more than 50,000 Americans annually.



The robot mower: a niche in the Green Industry's future?

It works in one of three ways: remote control (a human would watch the mower and guide it); trainable mode (a computer program would teach the mower boundaries of a lawn); fully automatic mode (the mower would be able to detect boundaries, flower beds, trees).

For added safety, the mower features a warning light and safety bumper which stops when the machine encounters an object; sonar detectors which locate and avoid stationary and moving objects; and an omni-directional vision system which allows the robot to avoid obstacles and monitor progress while cutting the lawn.

Studies have shown the robot mower to be economical for either domestic or professional use. It is ideal for an older or handicapped consumer who can't do strenuous work. With homeowner use, the mower pays for itself in three years.

A lawn care company which mows less than 100 acres weekly will pay for it in a year and a half. And, in large commercial use such as a municipal airport or highway, it can be paid off in less than a year.

Lawn care employes shouldn't be threatened by the robot. Hall says the machine will free up people to work on other areas of the landscape. Besides that, it will create a cottage industry for people to program or repair the robots.

The robot lawnmower is only the beginning. "I see people having not only the robot lawnmower, but indoor robots such as a vacuum cleaner," Hall says. The vision is reminicent of the old Jetsons cartoon.

The first step is for Hall to secure a deal with a manufacturer who can make the product economically. "As Henry Ford once said: 'If I can make it cheap enough for people to afford, I'll make a fortune.'

SURVEY

Water management a problem out west

Although water usage is not considered the primary problem faced by landscape managers in Southern California, it rates as "very important."

According to Janet Hartin, Cooperative Extension agent at the University of California, a survey taken at a horticultural short course noted that over-watering was most often cited as the major water-related problem.

"Water management, water quality programs and irrigation system design problems were frequently cited second water-related problems," says Hartin. "And almost all respondents said there was not sufficient information on water conservation available."

Circle No. 175 on Reader Inquiry Card →

LANDSCAPING

Royal garden challenge met by Ohio landscaper

When Jordan's King Hussein comes to town, Cleveland hustles.

The Mideast ruler paid a visit in June to the reknowned Cleveland Clinic for his annual check-up.

Waiting for him at the clinic was a beautifully-landscaped garden featuring some 5,000 flowers, myriad ground cover, manicured Kentucky bluegrass, some 30 newly-planted trees, and yes, a flag of Jordan painted into a garden slope.

What the King didn't know was that two weeks prior to his visit, the area was nothing but a construction area parking lot (an addition was being built) with the usual features—heavy equipment, dirt, and more dirt.

That was before Cavotta Landscapers Inc. of Cleveland took over.

The way the schedule worked: the concrete contractor had two days to lay sidewalks and curbs; Cavotta had four days to spread the topsoil, install an irrigation system, and plant the flowers, groundcover, sod (1,200 yards), and trees.

"They gave us a blueprint," vice-president Phil Cavotta recalls, "but everyone purchases their materials in April and May so there was nothing available. We had to summer-dig material."

With Cavotta frantically "pulling strings" to secure materials, site supervisor Kathy Trhlin-Russ barking signals, and a crew of sometimes as many as 18 working nearly round-the-clock, the challenge was met even though everything that was planted had to be checked by ever-present Secret Service people.

By June 8, one day before the King's visit, the garden was complete. "The big thing was the coordination of everything. It took a big effort on the part of everyone who was involved," says Cavotta. "I even pulled my dad out of retirement for this job."

It wasn't a small job. The garden area measures some 6,000 sq. ft.

Part of the 6,000 sq. ft. garden prepared in four days by Cleveland's Cavotta Landscapers Inc. in preparation for a visit by King Hussein of Jordan. Upper left inset is Phil Cavotta.

When things "slow" down, Cavotta maintains the 80 acres of the Cleveland Clinic "campus," with as many as 18 workers on-site even in the winter months. "It's like an airport here. You can't shut it down," he says.

Baseball field clinic

Chief groundskeeper Roger Bossard explains maintenance of infield and skinned areas of Comiskey Park's baseball field during a clinic held July 23, 1986. The clinic was co-sponsored by the Chicago White Sox and the International Minerals and Chemicals Co. More than 100 Chicago-area athletic field managers from schools, colleges and parks attended the one-day seminar.

SEED

Pickseed introduces Bronco bluegrass

Bronco Kentucky bluegrass is making its debut this month as a turfgrass developed specifically as a mix component with turf-type tall fescues.

Dr. Jerry Pepin, director of research at Pickseed West Inc., developer of the grass, says Bronco has good overall turf quality, heat tolerance, and disease resistance.

Bronco features a leaf width of 3.2 mm, a vigorous rhizome system that facilitates active spreading, and a moderate tiller density to create less competition with tall fescues.

Pepin recommends a tall fescue/Kentucky bluegrass mixing in 95-5 to 90-10 mix ratios. The mix is recommended for both professional and home lawn use.

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SHORT CUTS

NO FUN AT ALL...A record-breaking drought along the eastern seaboard tried the patience of many turfgrass managers this year. Lawn care and landscape management companies, obviously, had plenty of troubles keeping clients happy. Golf course superintendents were busy keeping courses playable, despite heavy irrigation. By the middle of July, Baltimore was typical of drought-stricken locales. And in that area, any turf not irrigated was deep brown. "When you go dormant in late May, you don't know what to expect," lamented Howard Gaskill of the Baltimore County Department of Recreation & Parks. "I *do* know that I've greatly increased my seed order this year. This weather sure does take a lot of enjoyment out of being a golf course superintendent."

WELL-TRAVELED... Patrick O'Bryan of Chicago has seen golf courses in so many parts of the world, he could serve as special counsel to the GCSAA. O'Bryan, featured on the front page of the *Wall Street Journal* last May, has seen land mines in the rough in the Falkland Islands and Soviet gunfire across a fairway in Afghanistan. He has played India's Royal Calcutta course, Iceland's Golfklubbur Akureyrar, and Egypt's Oberoi Mena House, 150 yards from the Great Pyramids. "I've got a bit of nomad in me," O'Bryan aptly claims.

SONAR SYSTEM... In the height of the pesticide scare, the Water Conservation and Control Authority of Lake County, Fla. has developed a system to warn people when any of its 25 lakes will be treated with Elanco's Sonar or other aquatic weed controlling chemicals. Executive director Will Davis puts a notice in the local newspaper and posts florescent orange warning signs around the lake. If that isn't enough, his staff goes door to door to every house on the lake to personally explain the treatment. Still, one homeowner pumped treated water from a lake and killed his lawn. The Water Authority replaced the lawn, but has since implemented a policy to survey lake residences after a treatment and videotape anyone using the water.

FOR YOUR CUSTOMERS..."What You Should Know About Professional Lawn Care," a full-color booklet answering six important questions posed by homeowners, is available from the Professional Lawn Care Association of America. The booklet was a joint project of the PLCAA and the Union Carbide Specialty Products Division. It addresses such questions as the safety of lawn care chemicals and the precautions taken by LCOs. Booklets are 25 cents each. For copies, write the PLCAA at 1225 Johnson Ferry Rd., NE, Suite B-220, Marietta, GA, 30067.

CORRECTION... An incorrect application cost was quoted for Limit turf regulator in the June "Short Cuts" column. Monsanto has not yet established a treatment cost for its turf regulator for the residential market. The cost of a professional application of Limit is currently $60 per acre.

"Let Blazon™ take the guesswork out of spraying!"

That's right! All of us have seen it before — that unacceptable area in our fairways or lawn. Just as important, an area where chemicals have been over-applied and a burned condition exists, and that can mean extra work for you. ¶ It's difficult to spray accurately and consistently on golf courses because every golf course is made up of countless slopes, contours, and bends. But with Blazon™ Spray Pattern Indicator you can take the **guesswork** out of spraying, **forever.** ¶ All you do is add Blazon™ right to your spray tank; it's totally compatible with the chemicals you use. It reduces lost time by quickly identifying a clogged nozzle, untreated or overlapped areas. In addition, Blazon™ is temporary and non-staining. ¶ Blazon™ Spray Pattern Indicator is the **new solution** to a never-ending problem. So contact the distributor nearest you for the product that has taken an art and turned it into a science—**"The Professional Solution for Professionals"...**

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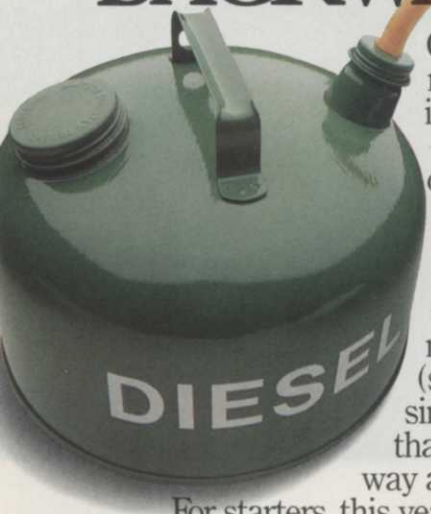
OTHER FRONT MOWERS SEEM BACKWARDS IN COMPARISON.



Our front mowers have really come a long way in a short time.

Just two years ago our first series rolled off the line, and this year we're back with a full line of sophisticated machines. We have a new package of features (some exclusive, others simply top-of-the-line) that put our front mowers way ahead of the other guys.

For starters, this year in addition to our gas-powered models, we offer two liquid-cooled diesel models, the 17-hp F915 and the larger 22-hp F935. These field-proven engines feature heavy duty design, especially in the block and crankshaft areas. Plus a full-pressure lubrication system to keep them running cooler for longer engine life.

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Combine those features with our new 76-inch wide swept spindle mowing deck (available on the F930 and F935) and you can forget about ever having to trim. You can cut around any tree or shrub, and leave an uncut circle of grass only 14 inches in diameter. Or use the turning brakes and mow right around a fence or lamppost.

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you cutting through long grass or in slippery conditions.

Of course, the best feature that we have to offer is our John Deere name. Which has come to mean quality and dependability. We stand behind our front mowers with a two-year limited warranty. And, in the unlikely event that anything should go wrong, you can go back to your local John Deere dealer. (Which shouldn't take long. We have so many commercial dealers across the country that there's probably one very close to you.) If he doesn't have the part in stock, he'll get it for you in hours—not weeks—thanks to our unique computerized FLASH™ parts system. Because he knows that if your front mower isn't working, neither are you.

While space here is limited, the list of terrific features on our front mowers isn't. To find out more, just write John Deere, Dept. 75, Moline, Illinois 61265. Or call 800-447-9126 toll free (800-322-6796 in Illinois) for the name of the dealer nearest you. If you're in the market for a front mower, we challenge you to check out the other guys, and then look at us. We'll only look that much better in comparison.

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THE KILLING FIELD

The Scott Halbrook story is a worst-case scenario. It should be required reading for all athletic turf managers. In this exclusive WEEDS TREES & TURF interview, Scott's dad and lawyer reveal the grim details of *death on a bad field.*

by Heide Aungst, associate editor

The shock of his only son's death left Alan Halbrook numb.

Scott Halbrook, a healthy, good-looking 19-year-old athlete, was too young to die. Because he was killed practicing the sport he loved—baseball—Scott's family cannot forget the accident.

At Marist High School in Eugene, Oregon, Scott lettered in football, basketball, and baseball. When offered a baseball scholarship at Oregon State University in Corvallis, Scott took the first step toward realizing a longtime goal — playing professional baseball.

But the dream ended tragically before Scott even had a chance to play a game for the Beavers.

On March 2, 1982, Oregon's soggy spring weather forced coach Jack Riley to hold baseball practice on the AstroTurf of Oregon State's Parker Stadium. (AstroTurf is a synthetic turf manufactured by the Monsanto Co. The team regularly played on natural turf.)

Local newspaper reports said Scott, playing left field, was injured in a collision with the shortstop while both were running for a short pop fly to the outfield. Scott died of head injuries three days later.

Scott's family—parents Alan and Betty, sisters Alana, Vinci, Janice, and Vicki—had no reason to doubt the story he heard of Scott's death...until the anonymous phone calls started.

The caller, according to Halbrook, said the artificial turf in Parker Stadium needed to be replaced. It wasn't the actual collision that killed Scott—it was the impact of Scott's head on the worn-out AstroTurf.

The original AstroTurf field was installed in 1969, replaced in 1974, but problems were detected, and it was replaced again in 1976. During that replacement, however, the old pad was left down.

When the Halbrooks searched for answers, Oregon State quickly cut off all communication. Halbrook obtained a test which had been conducted shortly after Scott's death. The test, done by a Monsanto competitor, showed the field to be intolerant to a human body falling on it.

Oregon's state adjuster offered a $5,000 payoff — "in good faith" — to Halbrook's family.

Halbrook filed suit against Oregon State, Monsanto, and Sports Install Inc., a subsidiary of Monsanto.

Attorney Dan Holland of Eugene uncovered internal Monsanto documents concerning the condition of Parker Stadium. One, dated November, 1981 (four months before Scott's death), rated the field in serious need of repair, judging by Monsanto's own grading system. Holland says the Monsanto inspector later claimed that the drop-test machine, a device used to measure field hardness, was broken that day, so he rated the field by walking on it.

Another document said the field was as hard as frozen sod or hard-packed clay.

Still another document, dated January, 1982 (two months before the accident), blatently stated, "This field needs to be replaced!" Later, there was a question as to whether that document should have been dated January, 1983.

Monsanto's defense in the case has been that Scott's head injury was caused by the collision, not when his head hit the AstroTurf. "There's a real debate over whether the death

blow was caused by him running pell-mell into the shortstop," says Frank Vible, Monsanto's assistant general counsel.

Despite the debate, the suit was settled out of court in September, 1985. The amount of the settlement cannot be disclosed.

How hard is hard?

The Halbrook case may seem like the artificial vs. natural turf controversy is again being dredged to the forefront. That issue has been endlessly hammered into the ground it covers.

There's no denying the lush, green color of artificial turf shows up beautifully on TV...mud is non-existent..and it takes the abuse of rock concerts, tractor pulls, and rodeos, along with the usual sports wear-and-tear.

It also survives in domed stadiums.

But there's no denying the increased injury rates—from "turf toe" and infected abrasions to serious head injuries—its (yawn) predictability...and the scorching heat emitted from the artificial turf on hot days.

There's always room to debate. But, in the best interests of the players, the artificial and natural turf industries should stop arguing and each take a critical look at the questions raised by the Halbrook case:

- *How hard is hard?*
- *Should there be a standard for athletic fields?*

"There's a real question out there," Holland says. "To what extent does the hardness of the field play a part in injury?

"The tendency is to blame something else...the athlete's condition, the risk of injury inherent in the sport, the equipment, the particular way the fall or injury occured. Where do you draw the line?"

In researching the case, Holland found studies and cases involving abrasions and turf toe, but little on hardness.

"I was really shocked at the lack of information about field hardness," Holland says."The bottom line is...is hardness an issue? That was the whole focus in the case and we found that it is an issue, so we tried to define the issue."

No excuse

Field hardness is becoming such an issue, in fact, that researchers at Penn State University have begun studying the hardness of natural fields.

Holland turned up several impact studies,

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and Halbrook dished out thousands of dollars for private studies to support his case.

Halbrook, a mechanical engineer, became consumed with the studies and documents trying to find answers to his son's wrongful death. "I read every one of them at least half a dozen times," Halbrook says.

They also discovered that in 20 years of making AstroTurf, Monsanto had never established a standard for hardness. But, then, neither had any other artificial turf manufacturer or the American Society of Testing Materials (ASTM), which has standards for most man-made products.

"Their excuse for failing to establish a standard in 20 years was to say that there's no standard on natural turf," Holland explains. "That's an improper perspective. They've created a product, put it in a different environment, and it works in a different way."

But Dr. Eliot Roberts, executive director of The Lawn Institute, says establishing a standard for natural turf fields will be necessary soon. With litigation getting out of hand, a law suit against a poorly-maintained natural turf field may not be far off.

In fact, it's difficult to even get university turf researchers to say, flat out, that natural turf fields are always safer than artificial turf fields.

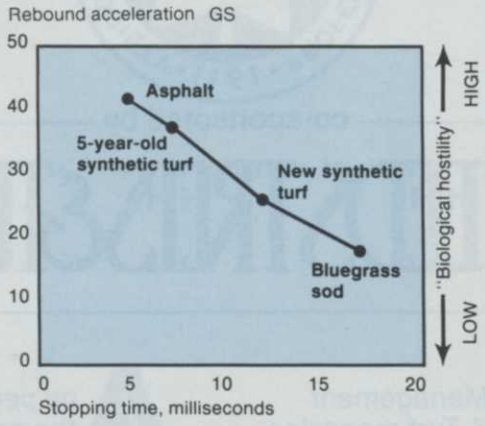
What may be true is that a *new* artificial turf field could be safer than a *poorly-maintained* natural turf field. But without standards in either industry, researchers hesitate to make blatant statements.

One of the most critical studies addressing this issue was published by Dr. Douglas Bower and Bruce Martin in *Medicine and Science in Sports* in 1974. The study, "Impact absorption, new and old AstroTurf at West Virginia University," looked at impact absorption effects on four surfaces: sod (well-maintained Kentucky blue grass about 1 ½ inches high); new AstroTurf (glued down to 5-year-old underpad); old AstroTurf; and asphalt.

The study found the "new AstroTurf surface approximates, but does not equal, a grass field in impact absorption capability...5-year-old AstroTurf surface has significantly decreased ability to absorb impact compared to the new AstroTurf."

IMPACT ABSORPTION OF SURFACES

Rebound acceleration and stopping time of a 16-pound indoor shot put on four surfaces, West Virginia University, 1974.



Alan Halbrook (right) and attorney Dan Holland examine less than half the documents in the case of Scott Halbrook's death.

The West Virginia study showed after only five years the surface had decreased dramatically. Parker Stadium's AstroTurf was six years old, the pad underneath eight. Besides the usual wear, ultraviolet light can break down synthetic surfaces and bacterial degradation can literally eat away the pad.

A standard for all

Dr. Bower, chief of sports medicine at West Virginia University Medical Center, completed an updated study in July. His results have not yet been published. But Bower is a big advocate of standards in all sports fields.

"I would like to see a standard for playing surfaces for specific sports," says Bower. "If artificial surfaces can meet that, fine."

Of course, Bower points out, a standard for a baseball field would differ from a football field or soccer field. But, he says, the standards should be set using good natural surfaces, not artificial turf, as a guideline.

Bower's research is unique. Although most companies "test" their own products, little objective research has been conducted.

Monsanto's Vible says he doesn't believe a standard is necessary for artificial turf, because it is "an essentially safe product."

"There is no vehicle for producing a general standard," Vible says. "There is no artificial turf trade association. ASTM has standards most of us abide by."

Holland points out, however, that ASTM has test standards, not safety standards, which take into consideration human tolerance. Besides, there's no requirement for companies to abide by test standards.

Penn State University graduate students Trey Rogers and Rich Henderson, under the direction of soil science professor Don Waddington, are measuring natural field hardness with a portable Clegg impactor. With this instrument, Rogers and Henderson will test fields under different conditions.

They will try to determine exactly how much affect various turf management methods, such as aerification and mowing height, actually have on the hardness of the field. Besides management methods, the researchers will check if turf species and root systems affect field hardness.

Henderson's tests so far have shown a decreased peak

continued on page 50

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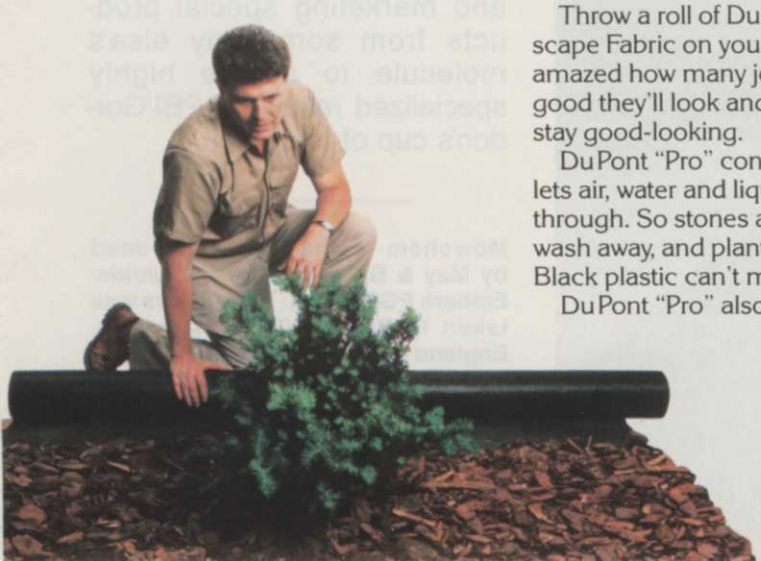

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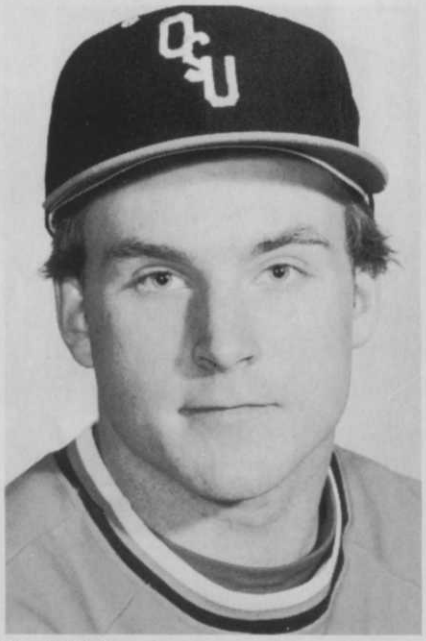

Scott Halbrook

deceleration with the presence of turf and with core cultivation.

If the research is conclusive, it could help determine a standard on natural fields.

"The hardness aspect comes into the play of the game," says Waddington. Many players claim, for example, that the evenness of artificial turf allows them to run faster.

Protective instincts

How much does the field actually affect play? Halbrook argues that players adapt their actions to field conditions.

But, he questions, when kids are put on artificial turf, do they realize they're essentially playing on asphalt, or does the green carpet make it seem like grass? If an athlete thinks he's playing on grass he may lose his natural protective instincts to defend himself in a fall.

"If you're playing basketball in the street, you know you're playing on asphalt," says Holland.

"I can't believe that if Scott knew he were playing on frozen turf or hard packed clay that he wouldn't have put his elbow down," says Halbrook. "When you aerate it loosens the soil, makes it less compacted. The grass is yea-high," he says, signalling an inch or two with his fingers. "You water it to maintain it. Everything you do to maintain a nice green field gives cushion to the field. That also gives more shock absorbancy. If it's brown, it shows immediately."

If a standard for athletic field hardness is established, all athletes would be aware of the type of surface they are playing on and its degree of hardness, whether artificial or natural.

Athletic field managers, researchers, and artificial turf manufacturers need to work together in establishing such hardness standards. Because one death is one too many. **WT&T**

AN ACT OF GOD?

You've heard it before. Injuries are beyond your control. But experts tell WT&T that the athletic field manager can make his field safer. Here's how.

by Heide Aungst, associate editor

At high schools and grade schools throughout the country, it's a well-kept secret. Those who dare to whisper the truth are quickly hushed.

"It's an act of God," they're told. God's will.

But injuries on natural athletic fields are not all "acts of God." The truth is that many could be prevented. Injuries are frequently caused by poor field construction, cheap seeding, and haphazard management practices.

Young athletes, at the mercy of "responsible" adults, are falling on jagged rocks, twisting ankles in undulations, and tackling each other on hard, compacted fields.

Penn State University has published possibly the only study dealing with the relationship of field maintenance to injuries. In December, 1984, professors Don Waddington (soil science), John Harper (agronomy extension), Chauncey Morehouse (physical education/director of the Sports Research Institute), and William Buckley (health education), published the study "Turf management, athletic-field conditions, and injuries in high school football."

The researchers evaluated varsity and practice fields at 12 Pennsylvania high schools for soil properties, field surface (undulations, stones, roughness), vegetative characteristics, and maintenance factors. They collected injury data throughout the season. (Only 10 schools turned in complete injury statistics.)

Of the 210 injuries reported, 44 (20.9 percent) may have been caused by field conditions.

Waddington says the study has been criticized for being on such a small scale, but it clearly illustrates that a connection exists between field conditions and some injuries.

The problem results from school administrators assigning someone, such as a janitor, without proper knowledge, to care for a field. Administrators often cite budget restrictions as the reason for failing to hire qualified field managers.

"My attitude is you can't afford not to pay someone," says Dr. Henry Indyk, extension specialist in turfgrass management at Rutgers University. "I can use the same philosophy in hiring a teacher in the school system. An athletic field is a very important part of a kid's education."

The budget also is to blame for lack of proper equipment and fertilizer.

Some corners can be cut to manage a safe athletic field at low cost. But, other factors should never be neglected.

Get advice

The first step in either building or renovating a field is to consult a local extension agent. "I don't know how many people know we're here," says Dr. Dave Chalmers, extension agronomist at Virginia Tech. "We're recognized more in rural areas, than urban."

Extension agents can be found at

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Dr. Don Waddington has studied the connections between injuries and field conditions.

Dr. Tom Turner says turf-type tall fescues are highly adaptable in the transition zone.

Dr. Dave Chalmers recommends seeking the advice of extension agents.

any land grant university, which usually has the main agriculture school in the state. Athletic turf seminars sponsored by the local extension service are becoming more popular.

Rev up community support

Most extension agents consult free of charge which is an advantage to schools with low budgets. Schools that can't get in touch with an extension agent can often get free advice through a local golf course superintendent or landscape contractor. When pinching pennies, borrow equipment from concerned superintendents or contractors.

Community education can be difficult to achieve, but is important to any field managers. Indyk advises that if administrators don't listen, go to the PTA. Concerned parents have a way of getting action when it's a matter of their children's safety.

Aerate often

Aeration is perhaps the biggest factor in maintaining a safe playing field. Every field, regardless of age, needs aeration to loosen the compacted soil. "Aeration is the difference between failure and success," Indyk says.

"We find the tendency is to not aerify anywhere near enough," says Roberts. He recommends aerifying, about three inches deep, in five different directions, "as often in the spring and fall as it is visually evident that the grass is weak because the ground is hard."

The cores on the field need to be broken to work as a top dressing, which stimulates grass growth. Breaking the plugs also helps keep the field level.

Roberts recommends dragging a chain-link fence over the cores to break them up. An upside-down harrow will also work (see WT&T "Jobtalk" April 1986).

Sample the soil

While aeration can help many fields, some fields need complete renovation. An extension agent can complete soil tests which are necessary in evaluating the type of maintenance a field needs. Although many managers concentrate solely on turf quality, soil needs to be a primary focus in an athletic field.

"The majority of fields are dead before they start because they use the wrong soil," says Dr. Joe Duich of Penn State University.

Soil tests provide the manager with a chemical analysis to see how much fertilizer is needed and an analysis of the soil's physical properties to determine the percentage of sand, silt, and clay.

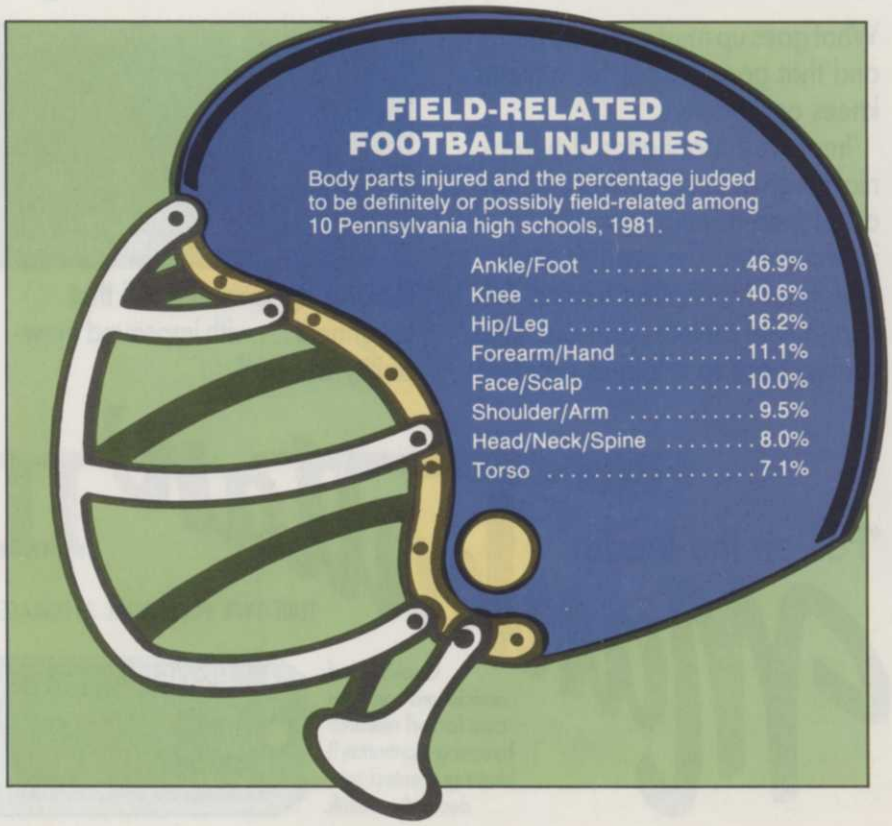
Dr. Eliot Roberts, executive director of The Lawn Institute, says a good sports field should have about 85 percent sand. The sand promotes drainage, which is also a key to a well-maintained athletic field. But, he warns, mixing in small amounts of sand will act like cement and clog a field.

"Too little sand can be more harmful than doing it right," Roberts explains. "Either go all the way or leave it alone."

For athletic fields which need help, but are hindered by budget constraints, Roberts recommends grading or contouring the surface. This is done with a grooving machine, such as the Ditch Witch.

The grooving should run from goal line to goal line, perpendicular with the flow of the water off the surface (toward the sidelines). The slits should run parallel to each other, every six feet, and be 18- to 24-inches deep.

The soil should then be hauled



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Scotts ProTurf

Larry, what makes Fairway Fertilizer with TGR™ Poa Annua Control so different from other weed control products? "Instead of acting like a conventional herbicide, the new Scotts product *slows* the growth of the *Poa* plant, diminishing its competitive ability. The result is a gradual, more natural transition to desirable grasses without a sudden decrease in playing surface quality."

That really changes the way you think about growth regulators. How does it fit in with current turf management practices? "Fairway Fertilizer with TGR Poa Annua Control has proven to be effective in reducing *Poa* populations even under conditions that would normally enhance their growth. Extensive testing has shown that this product fits in with a range of different management practices. Treat your turf with successive fall and spring applications until the *Poa annua* has decreased to the desired level."

What about those ugly *Poa annua* seedheads? "A significant benefit of the new product is a reduction in the visibility of *Poa annua* seedheads after one application. When applied before seedhead emergence in the spring, the treatment will slow the emergence of the seedhead stalk, resulting in fewer visible seedheads and more uniform turf color and playing surface."

How about color response? "This formulation provides not only selective control of *Poa annua,* but also extends the greening response well beyond what an equal rate of fertilizer alone can achieve."

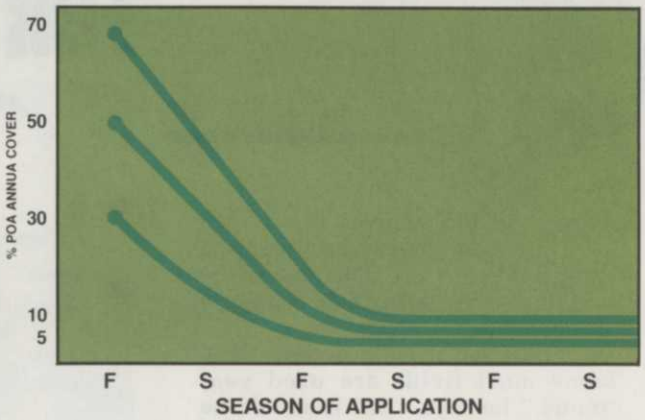
For more information on Scotts new Fairway Fertilizer with TGR Poa Annua Control, call your ProTurf Tech Rep. Or call Scotts direct at 800-543-0006. In Ohio, call collect (513) 644-2900.

"Now, with Scotts® new TGR*™ technology, you can outgrow your *Poa annua* problems."

Dr. Larry Widell, Scotts Research project leader (Plant Growth Regulator R&D), talks about new **Fairway Fertilizer with TGR™ Poa Annua Control.**

*Scotts trademark for its turf growth regulator technology

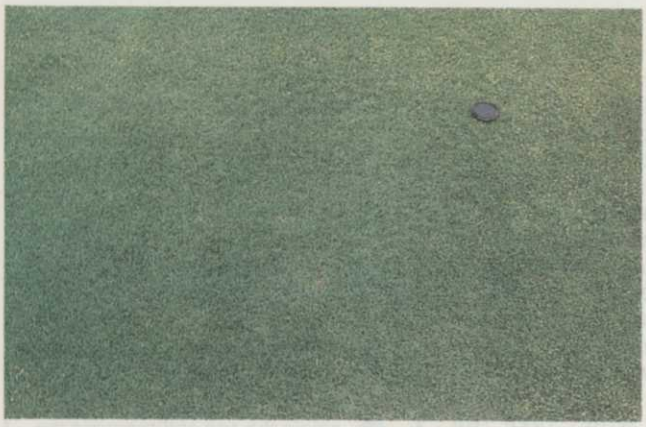
Aggressive bentgrass can be seen encroaching into an area of *Poa annua* treated with ProTurf Fairway Fertilizer with TGR Poa Annua Control.



Typical *Poa annua* population suppression is shown over time with continued use of Scotts Fairway Fertilizer with TGR Poa Annua Control. The degree of control may be influenced by turfgrass management techniques, climate, soil type and *Poa annua* biotype.

The treated area (left) in this mixed *Poa annua*/bentgrass fairway has been converted to predominantly bentgrass after three applications.

Notice the selective elimination of the *Poa annua* and the increased greening of the treated plots 7 weeks after application to a mixed stand of perennial ryegrass, Kentucky bluegrass and *Poa annua*.



Fewer seedheads are apparent in fairways when treated in the spring. The lens cap indicates the upper right corner of the treated plot.

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away, and the grooves filled with sand. The sand helps trap water and carry it into the soil. Roberts says the best time to renovate a field is in early spring or fall.

"There isn't really a good time, since most fields are used year 'round," he says. "But it should be done when the grass grows best. The summer is too hot and it doesn't heal rapidly."

Seed selection

The variety of seed used on an athletic field makes a difference. Roberts emphasizes the necessity to always choose a name variety. "There's a bunch of these name brands out, and there's not a great deal of difference," Roberts says.

New varieties provide improved insect and disease resistance. Common varieties or blends don't guarantee enough cushion to a field, he says.

On cool-season fields, Roberts recommends using bluegrass (Adelphi, Baron, Touchdown, Glade, Merit, Midnight, Aspen). Bluegrass spreads by rhizomes. It holds together well under use and also forms a good sod. The rhizomes will automatically fill in divots in the field.

Turf-type tall fescue (Rebel, Houndog, Mustang, Olympic, Falcon, Apache) doesn't have the rhizomes found in bluegrass. Roberts describes it as a "clump-type" turf. It needs to be seeded close together. Despite the fact that it won't form sod, turf-type tall fescue does offer improved disease and insect resistance and provides a rugged cover.

Dr. Tom Turner, extension turf specialist at the University of Maryland, says turf-type tall fescues are best to use in the transition zone.

"In Maryland, we're strongly pushing turf-type tall fescues," he says. "You have to irrigate bluegrass in Maryland for it to survive well. It's too hot and humid in the summer."

Turner says Maryland is "in a hotbed of anti-pesticide groups." With improved insect resistance, the turf-type tall fescues offer a good compromise.

Perennial ryegrass (All*Star, Repel, Manhattan II, Citation II, Fiesta, Pennant, Derby, Palmer) also doesn't spread by rhizomes, but, Roberts says, it is ideal for overseeding, repairing, or renovating a field. Several new varieties of ryegrass contain endophytes, which naturally fight insects.

Ryegrass can be blended with bluegrass, but Roberts advises against mixing it with tall fescues. "The ryegrass is more aggressive and tends to colonize," he explains. "It doesn't make for a uniform surface."

In warm-season turf regions, bermudagrass is most commonly used on sports fields. Some gulf coast states use bahiagrass. Several regions of Southern California use kikuyugrass, despite the fact that the Soil Conservation Service has outlawed it because it spreads into agricultural crops.

Centipedegrass won't take the wear of an athletic field. St. Augustinegrass and zoysiagrass get too thatchy and spongy to work well.

To manage a good athletic field, just remember:

FOR SAFER TURF....

Dr. Eliot Roberts

In order to build or maintain a good athletic field, Dr. Eliot Roberts, executive director of The Lawn Institute, suggests following these five guidelines:

1. **Land**—First assess the grade/slope of the land.

2. **Soil**—Take core samples to determine the depth of the topsoil, subsoil, and rock layer. Determine the mixture of sand, silt, and clay. To promote drainage, good fields should be about 85 percent sand. (See related story for an easy way to renovate a poorly constructed field) Check the physical properties of the soil such as the particle size.

While looking into the soil, consider how it will work with the installation of drainage, tile lines, and the irrigation system.

3. **Consultant**—Bring in a consultant or local extension agent who is knowledgeable in the design of drainage and irrigation systems. If you haven't determined the properties of the soil, use the consultant to do that at the same time.

4. **Seed**—Select a name seed variety with improved disease and insect resistance. The turf should be able to compete with weeds and take wear. Stay away from common varieties and blends.

Bluegrass works best in cool-season grass areas because it spreads by rhizomes. Turf-type tall fescues are recommended for areas in the transition zone because of insect resistance and drought tolerance. Ryegrasses are good for overseeding and repairing.

Most southern states use bermudagrass on athletic fields. Bahiagrass and kikuyagrass also work in some regions.

5. **Maintain**—After constructing a good athletic field, maintenance should not be neglected. Aeration is the number-one priority for any field. Aeration should be done as often as necessary in the spring and fall, in five directions, at a 3-inch depth.

Irrigation and cultural treatments can be determined by the soil analysis and turf variety used.

If you have any specific questions, be sure to consult your local extension agent. **WT&T**

The key to top turf

To manage a good athletic field, just remember GRASS.

G et advice from a professional consultant or extension agent;

R ev up community support for the needed budgets or equipment;

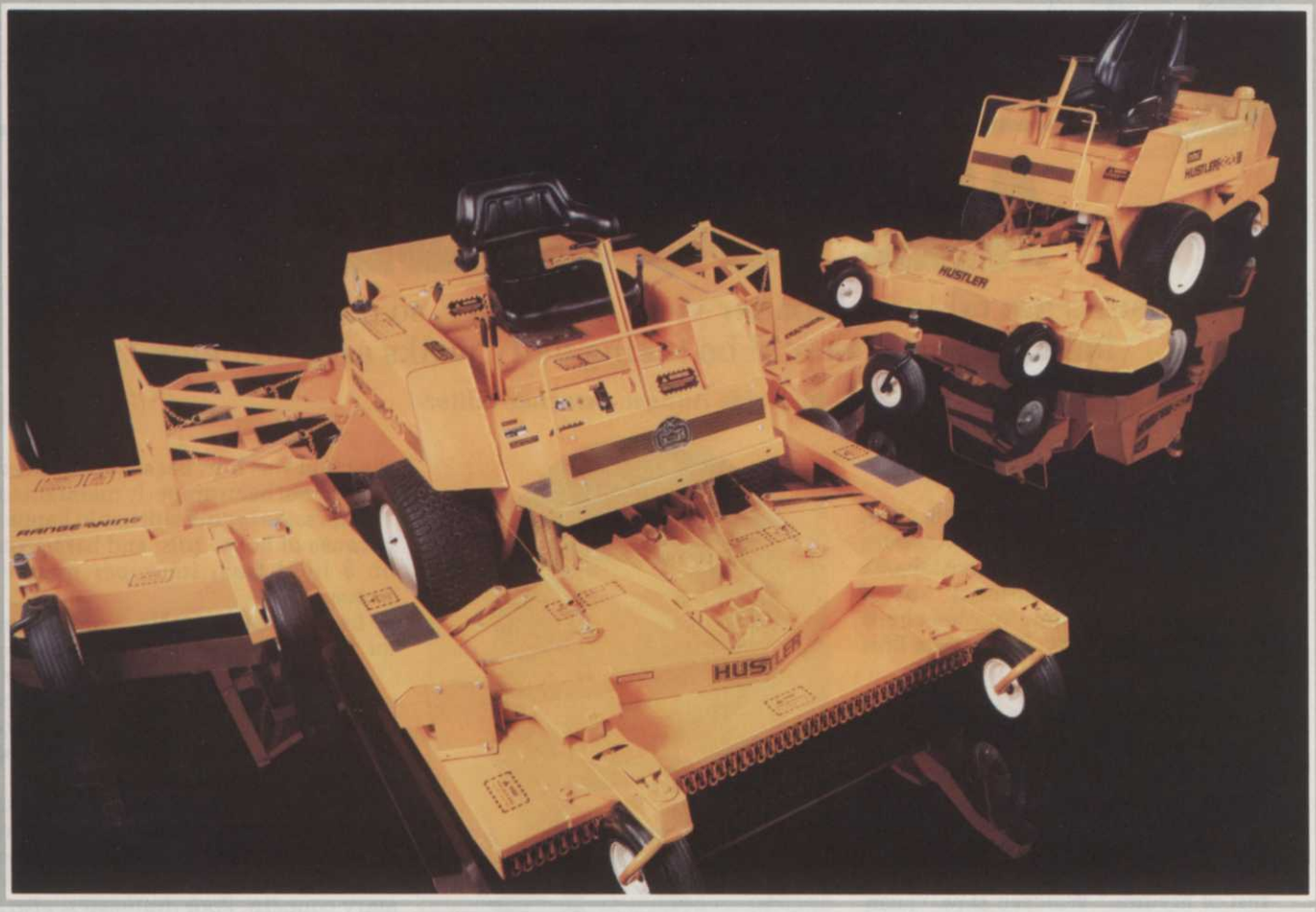
A erate a good field regularly and often; but, if the field needs help;

S ample the soil and renovate the field if necessary;

S elect seed carefully, using name varieties only;

WT&T

EDITOR'S NOTE: Special thanks to Dr. Fred Grau of the Musser Turfgrass Foundation and Dr. Eliot Roberts of The Lawn Institute for their time and effort in providing the WT&T staff with background information used in this series of articles.



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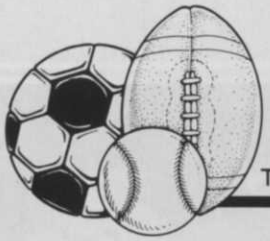


ARE YOU LIABLE?

The courts are taking a broader view of liability, so conscientious athletic field managers should be taking daily walks around fields.

by Heide Aungst, associate editor

The game: Texas Christian University at Alabama.

The date: October 26, 1974.

The play: TCU's tailback carries the ball on an end sweep. An Alabama player pushes the tailback out of bounds from the front. Another chops his legs from behind. The tackle flips the tailback.

End of play.

Former TCU tailback Kent Waldrep watches that play over and over again. Not on videotape, but in his mind.

That play left him paralyzed from the neck down.

"I'll remember that moment the rest of my life," Waldrep says. "I can think and visualize exactly what happened and what I felt like it was yesterday."

What he felt the moment his head hit the artificial turf was nothing. Nothing.

Then, within minutes, the tremendous pain started.

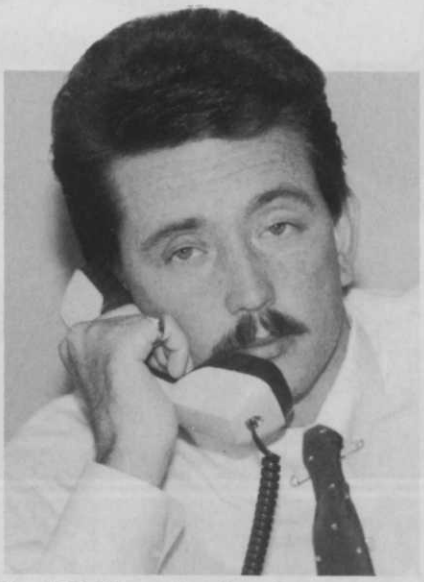
He spent a month in an Alabama hospital, then went to an acute spinal cord injury center in Houston for three months. He even became one of the few Americans permitted to receive experimental treatments in the Soviet Union.

Through all the physical pain, Waldrep had to endure the emotional trauma of starting life over in a wheelchair.

And, there were more frustrations. Less than a year after the accident, TCU officials stated they would no longer be responsible for his medical bills. An attorney advised him not to sue TCU.

But Waldrep did file suit in 1976 against the manufacturer of the artificial turf in Alabama's stadium.

The case was settled out of court in 1984, and, as is common in settlements, he can't talk about the case, even to mention the company he sued. But *Sports Illustrated* reported the suit was against American Biltrite, the manufacturer of Poly-Turf and the contractors who put it down.



Kent Waldrep: Paralyzed on artificial turf.

Although most law suits involving athletic fields focus on artificial turf fields, suits on natural fields may not be far off.

Going to court

Jim Leatzow, senior vice president of Financial Guardian Insurance, says field managers need to be aware that cases involving playgrounds and parks also affect athletic fields.

"The courts are taking a broader view of responsibility," Leatzow warns. "They hold a degree of liability and responsibility if someone is hurt because something is not properly maintained. The courts will ask, 'Is there something that could have been done to prevent the injury?' "

Leatzow cites a case involving a swing set which was set in concrete. The soft cover around the swing set had worn away because no one had maintained it. A child, misusing it, slid down the end support pipe and broke his leg. His parents sued and won a sizeable amount.

Leatzow says it didn't matter if the child was misusing the equipment. The court only looked at the fact that the child was hurt because the covering had not been properly maintained.

The same type of suit could happen because of holes, ruts, and bare spots on a field from improper maintenance.

Leatzow says the No. 1 precaution for field managers is common sense.

"By that I mean look for the foreseen problem, like equipment which is not up to snuff," he explains. "Make sure the field is properly lighted, no lights are burned out."

Besides the mechanics of a field, the actual field condition is important. Eliminating hard bare spots, holes, and rocks in the field should be a primary concern. Poor drainage is also a major problem. If someone were to sink into a spot, twist and break a leg, a field manager could become the center of a lawsuit.

"All you have to do is walk around," Leatzow says. "You should be making daily inspections of all athletic facilities."

Critics say the responsibility for an injury on a natural turf field would be too difficult to prove. But Leatzow points to the *Deep-Pocket Theory*.

The theory, more formally known as *The Doctrine of Joint and Several Liability*, allows an injured party to collect regardless of whom is at fault.

An example of this occured in California when a drunk driver, racing to cross railroad tracks before a train, ran off the road and into a gas station. The station exploded, injuring a man in a nearby phone booth.

The man sued. He collected from the phone company.

Profit motivated

In the case of artificial turf, it may take an actual court case to get standards or improvements, but even out-of-court settlements impact on liability insurance.

"The vast majority of cases never get to court," Leatzow says. "The insurance industry is profit motivated. For that reason, it's more expedient at

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times to settle out of court, rather than fighting the case on principle."

In the Halbrook case, college baseball player Scott Halbrook hit his head on Monsanto's AstroTurf (see accompanying story), allegedly causing his death. Monsanto assistant general counsel Frank Vible says the company offered a settlement in September, 1985, for purely economic reasons.

"It was not an admission of guilt," Vible says. "We felt that the economics indicated that it would be a lengthy trial and there would be a lot of sympathy for the plaintiff."

Dan Holland, attorney for the Halbrook family, says they decided to accept the settlement because Monsanto offered enough money.

"None of us will ever know if we made the right decision," adds Alan Halbrook, Scott's father. "But I got the information I went after."

Opponents of artificial turf say it will take a well-publicized case which actually goes to court before anything will be done about the problems with artificial turf. Most of the cases are settled out of court with a non-disclosure clause.

Insurance expert Jim Leatzow says athletic turf managers are liable for injuries on natural turf.

No choice but to settle

Waldrep feels he had no choice but to settle. When TCU cut off its financial support, Waldrep was left without medical insurance. The bills had to be paid.

"I couldn't afford to go to court and lose," he says of his decision to settle. "I wish it could have been me. It was an extremely hard decision...almost like giving up, and I've never given up on anything in my life."

Although Waldrep's and Halbrook's cases were serious, a vast number of lawsuits today aren't. Leatzow feels there should be an incentive *not* to sue frivolously. In Europe, if someone sues and loses the case, the loser is then responsible for the other party's attorney's fees.

Without such incentives, athletic field managers need to be extra cautious about properly maintaining an athletic field.

Rash lawsuits could make it difficult for schools to get liability insurance. Not having insurance could put some sports programs in jeopardy.

As the old adage goes, "An ounce of prevention..." **WT&T**

One wheelchair is too many

by Dr. Kent Kurtz

"Why is it that people wait until someone gets hurt to fix a playing field?"

Jeff Wishard, 26, speaks from his wheelchair:

"Neither the doctors, coaches nor my teammates are really sure how my accident happened. One theory is that, on impact, my head may have been forced down into the ground.

"The practice field was in real poor condition. That particular field was used for many activities other than football, and was extremely hard. The only maintenance to the field was a weekly mowing.

"When the field was wet, it was muddy. During the hot, dry weather in the fall, the surface was hard and traction was very poor. It was comparable to the farmer's field adjacent to the school."

Jeff Wishard: "Neither the doctors, coaches nor my teammates are really sure how the accident happened. One theory is that, on impact, my head may have been forced down into the ground."

Some people are beginning to question whether the satisfaction of making a desperation tackle or scoring a touchdown is really worth the risk of becoming a paraplegic or quadriplegic.

The incidence of catastrophic injuries (those that result in permanent spinal cord disability) is not large when based upon player populations of 100,000. Data indicate that, in 1984, 1.575 million football young men played college and high school football, but only 0.38 percent were injured severely. Most spinal injuries occur during regular games to defensive players, and the majority are associated with blocking and tackling.

Such is the case of young Wishard, who suffered through a football field injury which has left him a quadriplegic.

Wishard lives in Davis, Ill. (pop. 550). Parents Ron and Sandy own an automotive body shop and gasoline

Dr. Kent Kurtz, executive secretary of STMA, is a WT&T advisor.

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station. His mother works for an optometrist. The Wishards are a typical hard-working, middle class Midwestern family who are well-liked and very active in the community.

When Wishard was injured 11 years ago, the family was not prepared for the hospital bills, the special care required, the anxiety that followed or the weeks, months, and years of learning to adjust to a new kind of life.

Tragedy strikes

On Oct. 15, 1975, the Dakota High School freshman/sophomore football team was going through a normal practice session.

Some people are beginning to question whether the satisfaction of making a desperation tackle or scoring a touchdown is really worth the risk of becoming a paraplegic or quadriplegic.

Wishard recalls the day vividly.

"We had just finished our calisthenics on the Dakota practice field and our coach, Jeff Clark, was conducting what was called the 'hamburger' drill," he recalls. "As the defensive player, I was supposed to jump up (from the ground), turn around and tackle the offensive player. On my first attempt, I slipped on the hard, bare soil surface and by the time I recovered the offensive player had gotten passed me."

The coach told Wishard to try again.

"All I can remember from my second attempt is falling to the ground in pain and calling for the coach. I laid on my back while my helmet, socks and shoes were being removed. I knew something serious was wrong and I think the coach and team manager knew I had a broken neck. When they ran a pencil along the bottom of my feet to see if I had any sensations and I didn't, they called an ambulance."

In the next few hours, he went from hospital to hospital. Wishard remembers seeing his mother at Freeport Hospital.

"When I awoke again, I was being transported to Rockford Memorial Hospital. During the ride, the shock subsided and I hurt real bad. My father was waiting at the Rockford hospital, and I'll never forget the shocked expression on his face. He was as white as a ghost," recalls Wishard.

Wishard soon learned that he had a broken neck, several fractured cervical vertebrae and would probably be a quadriplegic the rest of his life.

Wishard's injury seemed to bring more parents out to Dakota football games during the fall of 1975—perhaps because parents became more concerned or aware of their youth's welfare. They might have wanted to make sure their sons were receiving adequate instruction on the basic football fundamentals.

No better today

The maintenance of football fields in the Northwest Illinois Conference has not been upgraded or improved significantly since the Wishard injury.

Eleven years later, inspection of the Dakota High School football practice and game fields reveals hard, compacted surfaces, several grassy and broadleaf weeds and a maintenance program geared to a weekly mowing. Watering, fertilizing, aerifying, weeding, and the introduction of new turf-type grasses is apparently non-existent.

Minor injuries, and some serious such as broken legs or arms, twisted ankles, broken knuckles and knee injuries continue at Dakota and other conference schools because of rough terrain and poor quality turf.

Two prominent researchers feel that catastrophic football injuries may never be completely eliminated. But a united effort involving coaches, players, administrators, researchers, physicians, trainers and equipment manufacturers is required to identify the problems and then take the necessary preventative measures.

Hope for tomorrow

The purpose of the Sports Turf Manager's Association (STMA) is to provide knowledge and education to improve athletic field conditions throughout the United States, Canada and other countries. STMA is making a concerted effort to get grounds supervisors and personnel to become members and to join forces to combat unsafe athletic facilities everywhere by providing quality fields for the youth and athletes.

STMA would like every athletic field manager to come together to solve problems, learn about new ideas and techniques, and find ways to further reduce severe athletic injuries.

STMA has long advocated that the easiest way to reduce injuries is to provide a well-turfed practice facility and game field. Selecting and using the adapted turfgrass species, fertilizing often enough and correctly, providing adequate water for the turfgrass plant, mowing at the correct height, and aerifying and topdressing to encourage deeper roots, a more resilient surface and a non-compacted soil medium can go a long way toward reducing sports-related injuries.

WT&T

Preventing, not promoting, the injury

by Ken Kuhajda, managing editor

A high school football player suffers a serious injury; not an abrasion or a bump. He tears up his knee.

His parents in the stands don't give a second thought to the condition of the natural grass field. After all, their son is hurt.

But would that player have been injured so seriously if the field were in better condition?

Data on whether a field's condition contributes to an injury is hard to find. At the playground, grade school, and high school levels, there haven't been many studies conducted.

"It's one of those things people just don't want to talk about," says Dr. Eliot Roberts, director of The Lawn Institute. "If there is a tie-in between field conditions and a young person's injury, it's not discussed much. The school systems just have too many other problems."

Adds Dr. Bill Knoop, Texas Agricultural Extension Service turfgrass specialist: "Some people don't want to document the relationship between field conditions and injuries because of the liability question."

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Educating turf managers is one of the goals of the Musser Foundation. Ads like this help.

However, one well-known study suggests that yes, the field's condition does make a difference in the number and severity of injuries.

Revealing research

Penn State University performed a study in 1983 that found roughly 20 percent of all football injuries (in four categories) sustained by Pennsylvania high school players could have been "prevented or perhaps rendered less severe by more favorable field conditions."

Penn State extension agronomist Dr. John Harper II notes that most of the injuries judged to be related to field conditions involved the lower extremities (the hip/leg, knee, and ankle/foot).

The study concludes: "The results indicating that one of five injuries may be field-related should be an incentive to construct and maintain high quality playing surfaces."

Another study had similar findings. Carol Ann Comly studied 10 Pennsylvania high schools in 1981 to determine the specific cause of some 35,000 injuries recorded at the schools. (See Chart, p. 26.)

Dr. James Garrick, director of San Francisco's Center for Sports Medicine at St. Francis Hospital, agrees that field condition does make a difference. But he adds an asterisk.

"I suspect it does, but it's awfully difficult to sort out." Garrick suggests there's a give-and-take trade-off on all surfaces.

"People complain about fields being too hard, but a player's cleats don't get down into the hard field so there's less locking and less twisting-type injuries," he says. "But there are problems with bumps and bruises so it's sort of a trade off. By the same token, a good grass field will allow the cleats to escape if you put pressure on the foot," thereby causing fewer injuries, he says.

However, Garrick notes, "I think most people will agree that a well-maintained natural field is the best surface."

Practice fields worse

There's little doubt that improper maintenance is contributing to the problem. Harper and colleagues compared playing conditions on practice and game fields at 12 secondary schools in Pennsylvania and found practice fields were used far more yet maintained far less.

The study reported just 25 percent of the practice fields and 75 percent of the game fields were aerified to relieve compaction.

Little fertilizer was used on either practice or game fields. Not one school reported using herbicides on its practice field.

"We know how to grow the grass to provide the reliable footing needed by athletes," says The Lawn Institute's Roberts. "The bad fields can be corrected without a lot of expense. The fields just need to improve a little each year."

Free information

In Texas, Knoop provides many high schools with football field maintenance information at no charge. He says the injury rate of participating schools has dipped.

"The testimony of the coaches I've worked with indicate that as their fields improve, the number of injuries decrease," says Knoop. "I have several coaches who've not had serious injuries in years because of the good field conditions. Some of the coaches at smaller schools tell me they couldn't put a team on the field because they had so many injuries before they went on our program."

"There's no doubt in my mind" that a field's condition plays a role in injuries, says Comly, now a physical therapist. "As a (athletic) trainer, one of the first things you do is go out onto the field ahead of the team and look for potential trouble spots," she notes.

Adds Roberts: "It's my strong opinion that field condition is a major factor in injuries. The evidence is there, but the problem is not being able to document."

Slow-moving research

Roberts began researching the relationship of good turf to fewer injuries in 1964 while at Iowa State University. Since that time, there have been few studies on the subject.

There is much research available on the increased injury rate on synthetic surfaces. Never has a study revealed fewer injuries sustained on synthetic surfaces, says Garrick.

(The average career span of an NFL player has dwindled from 4.2 to 3.6 years, according to a survey by the NFL Players' Association. Seventeen of the 28 teams play on synthetic turf.) However, research on the conditions of natural turf fields and injuries has moved at a snail's pace. "It's been going on a long time but not much progress has been made. We need to educate the people taking care of the fields, we have to convince people that we need improved fields," says Roberts.

"Even if you eliminate just one percent of the injuries, it's worth it." **WT&T**

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The ever-popular hydroseeding technique is a fast and economical method of seeding that can save you money.

by Jack Dirksing

Convenient uses for hydroseeding techniques contribute to growth in the green industry.

What started in 1953 as the answer to highway roadside seeding has evolved into a vital means of seeding for virtually any job that requires grass to be grown: landscape construction, private and commercial real estate development, golf course construction, highway roadside development, soil conservation, park construction, and many more.

When the 500-gallon HydroSeeder was introduced in 1958, the progression from seed broadcasting to hydroseeding became a natural step for many landscaping companies.

The addition of hydraulic mulch into the seeding process began in 1961 when International Paper developed Turf Fiber, a "cooked-wood" product. The methods for applying mulch together with seed and fertilizer continued to be refined throughout the '60s. By 1970, "one-step" seeding was an established practice in the revegetation industries.

Today, more landscape contracts are calling for hydroseeding. But, if need be, hydroseeding can be promoted by offering a weed-free lawn installation for less cost than sod. Small, previously impractical jobs can be made profitable by the speed and low labor demands of hydroseeding.

The process is less messy than straw, and hydraulic mulch will not blow away under normal conditions.

The equipment

Hydroseeding is relatively simple. But just as important as the decision to buy equipment is the selection of the right size machine. Consideration should be given to both current jobs and those in future plans. (For tank sizes and coverages, see accompanying chart.)

The hydroseeding process itself is simple.

Jack Dirksing is president of the Finn Corporation.

The Reinco Hydrograsser uses hydro-jet agitation with a grinder/blender feature.

Tank Working Capacity (Gal)	Acreage Per Load: With Seed, Fertilizer, Lime	Acreage Per Load: With Wood Fiber Mulch
500	1-3/4	1/6
800	2-1/2	1/4
1000	3	1/3
1300	4	1/3 to 1/2
2500	8	2/3 to 1
3000	9	3/4 to 1-1/2

The materials put in the tank are mixed with water and kept in suspension by agitation. Seed, mulch, and fertilizer are introduced to the tank as it fills with water.

Seed protection

Hydraulic mulch of today is typically a ground wood or paper product. When applied through a HydroSeeder, it serves to protect the seed as it begins to germinate and establish itself.

A harmless green dye is added to the mulch as a marker between loads, allowing the operator to easily identify and judge the amount of material being applied. Additionally, the dye gives a green appearance until the grass begins to germinate.

Most applications call for 1,000-2,000 pounds of hydraulic mulch per acre, depending on specifications, soil conditions, and type of mulch.

Additional products to enhance the seeding operation and satisfy specific needs are available. These can be added to the "recipe" during tank loading. Mulch tackifiers, water retention agents, and fiber length enhancers are typical additives.

The slurry is then pumped to the discharge assembly and directed onto

Reinco's Power Mulcher.

the seedbed by the machine operator. Discharge of the slurry (the mix of all materials) is done either from a tower-mounted gun on the tank or, for a more controlled application, through a hose and a remote valve.

HydroSeeders come equipped with a variety of nozzles to allow the selection of several different spray patterns: wide fan, narrow fan, and long-distance.

A discharge tower is standard equipment on all but the smaller HydroSeeders, where it is not considered necessary.

An electric (or manual crank) hose reel can be mounted on any size Hydroseeder. This allows the convenience of 200 feet or more of hose for jobs not permitting the machine to be close to the work. Most owners prefer the electric reel, as the small added cost of the motor outweighs the time and labor involved in hand cranking.

Few problems

Problems associated with hydroseeding are minimal. However, certain practices must be observed.

Seedbed preparation — The time spent in preparing a good seedbed will yield higher germination and turf density. Highway roadsides, mining reclamation, and landfill seedings require considerably less preparation.

Seed selection and application — Seed selection depends on many variables: width of grass leaf, erosion control ability, drought resistance, disease and fungus resistance, and soil conditions.

In most instances, cereal crop seeds are blended with turfgrasses. The cereal crop or nurse crop seed gives rapid germination and plant growth, protecting the primary grass seed from erosion and the elements. Typically, nurse crop seed germinate in less than seven days while primary grass seed takes at least 14 days.

Rate of seed application is determined by needed turf density and percentage of seed germination. Local seed suppliers are often the best source of information on seed and application rates.

Soil amendments — The selection of fertilizer, lime, and other soil amendments is often overlooked. However, selection is vital to the turf's establishment. The soil's nutrient level and pH additives determine the grass plant's vigor and vitality.

An inexpensive soil test kit can be used to determine the amendments needed. After taking the test, a suitable fertilizer plus pH additives can be added to the HydroSeeder slurry. Again, local suppliers can be a good source for this information.

Moisture retention — After the hydroseeding is completed, regular watering is necessary for the development of healthy turf. This is especially important in arid areas or in summer months when rainfall is limited.

The hydroseeding mulch will absorb and keep water available for the germinating seed. The mulch's ability to hold water varies. Mulches also tend to insulate the seed and soil, protecting it from direct exposure to the elements.

Temporary irrigation on small to medium size projects is rapidly gaining acceptance in areas where little precipitation is expected.

Erosion — Seed and seedbed erosion are probably the most difficult problems to solve, and the most important consideration to make while hydroseeding. Landscape and seeding contractors are constantly faced with washout due to heavy rain. Hydraulic mulches control erosion to a greater or less degree, depending on their derivation and fiber length.

For additional insurance against erosion of the mulch and seedbed, tackifiers or tenacious synthetic fiber should be added to the slurry. Tack

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The Finn Corporation's HydroSeeder.

ifiers bind individual fibers of the mulch together with a water-insoluble, semi-porous film or crust. Tenacious synthetic fibers (mulch fiber enhancers) add fiber length to the slurry and entangle with the fibrillated fiber of the mulch.

The list of erosion control products for use with HydroSeeders grows as new technology is developed. Using an additional product depends, in part, on cost, site condition, rainfall and guarantees of the contract or specifications.

A brief history

Back in 1949, the term "hydroseeding" didn't exist. The technique used to seed was a far cry from today's advanced technologies.

Seeding was seeding, no matter where it was being done...highway or agricultural areas.

On flat areas, scarification and seedbed preparation was followed by the use of agricultural grain drills which placed the seed. On steep slopes, the cyclone hand-operated seeding maching or hand broadcasting the seed were the only methods available.

After planting seeds, a light raking with hand rakes, followed by hand-mulching, finished the job.

Not until the development of the Highway Trust Fund and Federal Interstate programs was it clear that a more rapid, effective, mechanized piece of equipment was needed.

In 1953, Charles Finn of the Finn Equipment Co. developed the first commercially successful Hydro-Seeder. It mechanically mixed seed, fertilizer, and lime with water, producing a slurry mixture, which was then applied to the seedbed.

The first machine was a two-piece unit consisting of a 1,000-gallon tank set in a small wheelbase dump truck with a separate pumping unit towed behind. As years passed, demands for a more compact piece of equipment were met.

Through the years, hydroseeding has evolved into perhaps the most economic means of establishing vegetation. It's a proven time-saver, labor-saver and profit-enducer. **WT&T**

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EQUIPMENT ____ 72
EQUIPMENT COMPANIES ____ 106
CHEMICALS ____ 122
CHEMICAL COMPANIES ____ 129
SEED VARIETIES BY COMPANY ____ 132

1. Equipment

Aerators, Aquatic

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Kembro Inc
Son Shine Nursery

Aerators, Soil

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A B Chance Co
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Hockney UnderWater Weed Cutters
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Playworld Systems
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Birchmeier Backpack Sprayer

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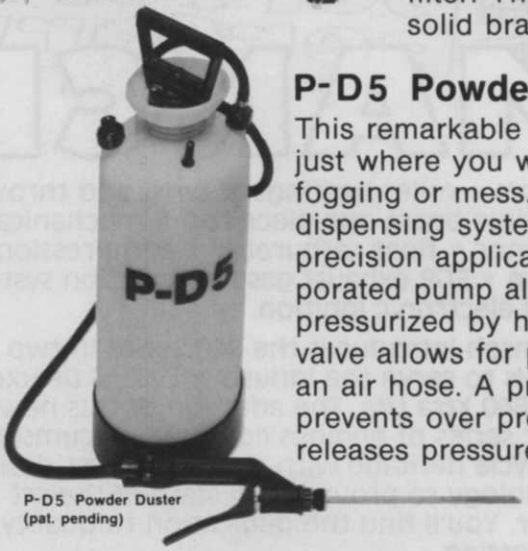

P-D5 Powder Duster (pat. pending)

P-D5 Powder Duster

This remarkable sprayer puts dust just where you want it — no more fogging or mess. A unique dispensing system allows for precision application. An incorporated pump allows the tank to be pressurized by hand. A tire-type valve allows for pressurizing with an air hose. A pressure relief valve prevents over pressurizing and releases pressure prior to opening.

All Trebor polyethylene products have ultra-violet inhibitors for protection from prolonged exposure to sun light.

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Tough mowers... from rough cut to smooth finish.

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Superior performance in both rough cut and refined mowing at speeds to 11 miles per hour. The "CM" gives the commercial user a tough, low maintenance machine that mows better at top speed than other mowers at half the speed. And does it with the added safety of rear discharge.

Kut-Kwick. More than forty years of experience building professional mowers for professional users.

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HYDRAULIC MULCHING WITH CELLIN IS EASY, AND FAST, AND ECONOMICAL. SEED, FERTILIZER AND MULCH ARE MIXED INTO A SLURRY AND SPRAYED ONTO THE GROUND — IN ONE EASY STEP.
TACKING STRAW (OR HAY) MULCHES WITH CELLIN MULCH IS EFFECTIVE, AND FAST, AND ECONOMICAL.
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CELLIN MULCHES ARE FORMULATED TO MIX READILY WITH WATER AND TO REMAIN EVENLY DISPURSED IN THE SLURRY.
PACKAGED IN 50 lb. HEAVY DUTY POLYETHYLENE BALES — EASY TO HANDLE, STACK AND STORE.

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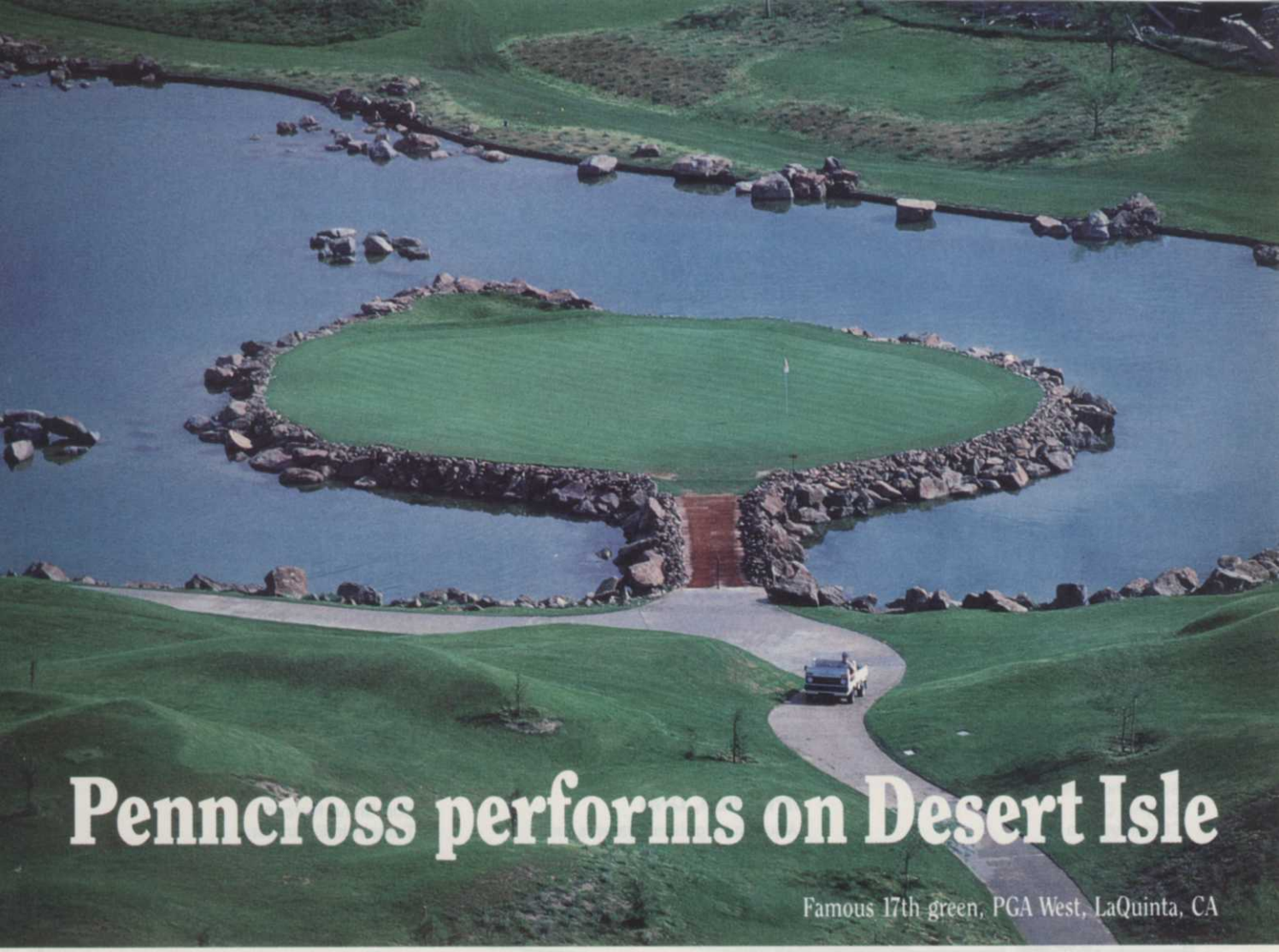


Penncross not only survives, but thrives on all 18 greens at this innovative Pete Dye designed course.

You've seen this awesome 17th green in pictures, or maybe you've had the good fortune of playing this 147 yard challenge, but we're reasonably sure you didn't know that it's Penncross creeping bentgrass. Television announcers won't tell you and magazines don't print it, but the putting greens that have made more champions on some of the greatest courses in the world are Penncross.

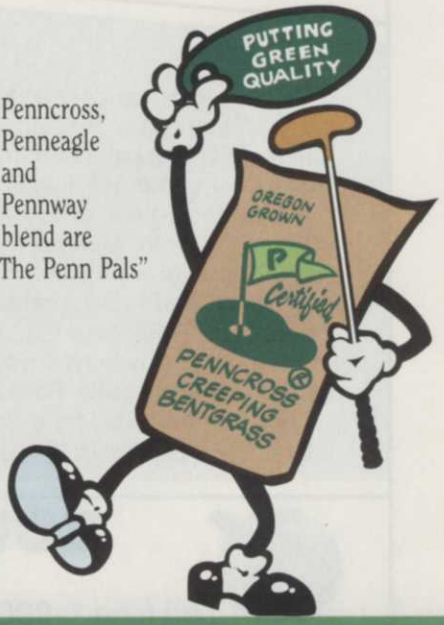
PGA West is a revolutionary new course with target greens, stadium spectator mounds and punishing hazards. Why would such an innovative designer use a strain of bentgrass that's been around for so many years?* We maintain that there is no better all-around bentgrass anywhere!

Some people say that bentgrass won't survive the intense sunbelt heat. We have evidence to disprove that notion. Penncross, and its Penn Pal, Penneagle have grown in popularity on courses from California to Florida . . . where bermudagrass used to reign.

Pete Dye specified Penncross for *this* desert isle, as he did for his famous Sawgrass island green in Ponte Vedra, Florida. Penncross is no ordinary putting green grass . . . and Pete Dye is no ordinary designer.

Watch Penncross perform in the *Skins Game* at PGA West, Nov. 29 and 30, 1986.

Penncross, Penneagle and Pennway blend are "The Penn Pals"



*Penncross is a tried and true cultivar developed by Professor Burt Musser at Penn State University and released in 1955.

Penncross is marketed by **TEE-2-GREEN CORP** / PO Box 250, Hubbard, OR 97032 / 1-800-547-0255 / TWX 510-590-0957

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THE ORIGINAL IS BIGGER

Bowie's new Lancer 500 brings perfection to originality. It has a 30% greater capacity than our Lancer 350, and can hydro-mulch a standard residential corner lot in less than an hour.

We perfected our Lancer 350–the first production Hydro-Mulcher® manufactured–because we weren't satisfied with originality. And today, professionals call Bowie Hydro-Mulchers the "landscaper's workhorse".

Both these Bowie Hydro-Mulchers are small enough to operate in tight places, yet large enough to handle big jobs easily. Both load quickly, mix instantly and pump rapidly–without clogs.

Call or write today for a Bowie Hydro-Mulcher brochure. The original just got bigger. It's always been better. Because Bowie is built to stay that way.

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Castle Pines Golf Club, twenty minutes south of Denver, Colorado, will host the inaugural "International" this summer.

Grounds for Ransomes.

Getting ready for a PGA TOUR event is grounds for using the Ransomes Motor 180. This compact, lightweight ride-on triple provides exceptional maneuverability and ground-hugging stability, even on steep slopes. Available with floating head cutting units, the Motor 180 closely follows ground contours on undulating terrain like Castle Pines, and provides a superb finish to difficult areas. A golf course with the natural beauty of Castle Pines deserves to be kept looking and playing its best: a worthy challenge to a caring groundskeeper. And that's grounds for seeing your Ransomes Bob Cat distributor. Or call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038, (414) 699-2000.

RANSOMES

The grass machine.

Circle No. 156 on Reader Inquiry Card

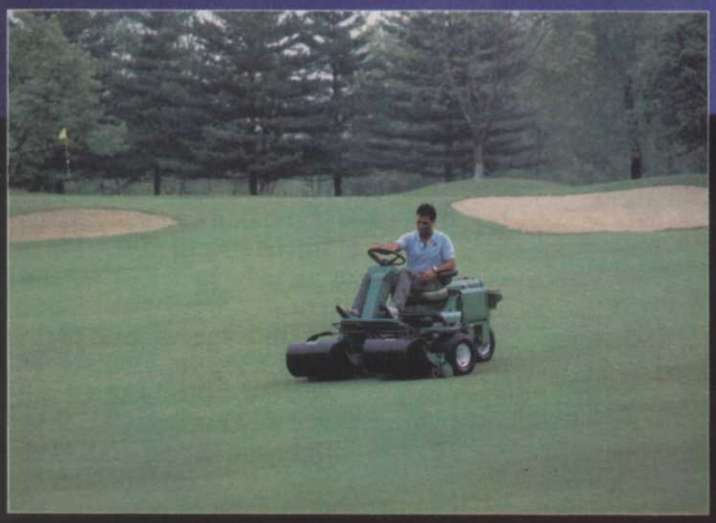
Introducing

From LESCO, the company that listens and responds to customer needs, comes a complete new line of small-particle sulfur-coated urea fertilizers.

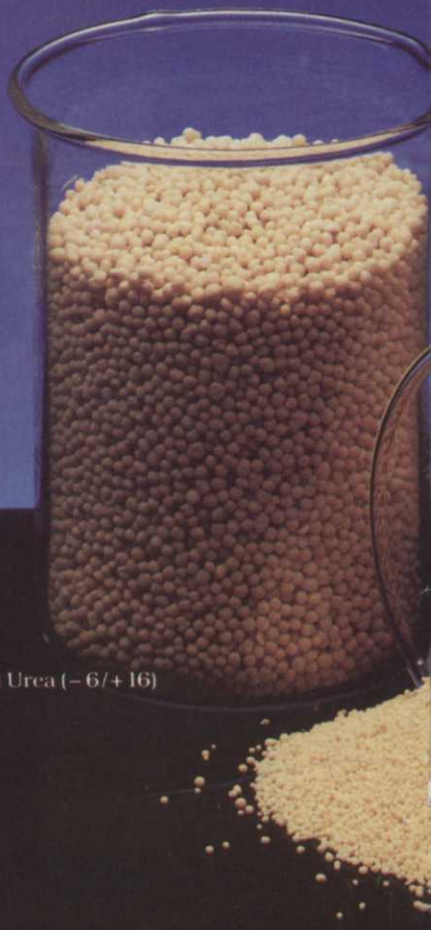
Specifically designed for low-cut turf, the new ELITE fertilizers from LESCO provide many more particles per square foot than coarser-grade products that can cause speckling. That means consistent greening and a more uniform distribution pattern. In addition, the slow-release feeding provided by the sulfur-coated urea insures steady growth and long residual.

Shown is a half-gram each of granular sulfur-coated urea fertilizer (– 6/+ 16) and LESCO ELITE sulfur-coated urea fertilizer.

The chance of mower pickup is virtually eliminated with ELITE fertilizers because the new small particles readily filter into the turf.



The chance of mower pickup is virtually eliminated with the new LESCO ELITE fertilizers.



Granular Sulfur-Coated Urea (– 6/+ 16)

LESCO

ELITE

And because LESCO manufactures its new ELITE fertilizers using sulfate of potash, there's more plant-available sulfur and low potential for burn.

The fertilizer you've been waiting for is available now in six analyses: 21-0-16, 19-0-19, 15-0-30, 12-24-14, 21-4-12 and 31-0-0.

LESCO ELITE is available now in a variety of analyses.

To order the ELITE fertilizer that best fits your needs, call us toll free today.

(800) 321-5325 NATIONWIDE

(800) 362-7413 IN OHIO

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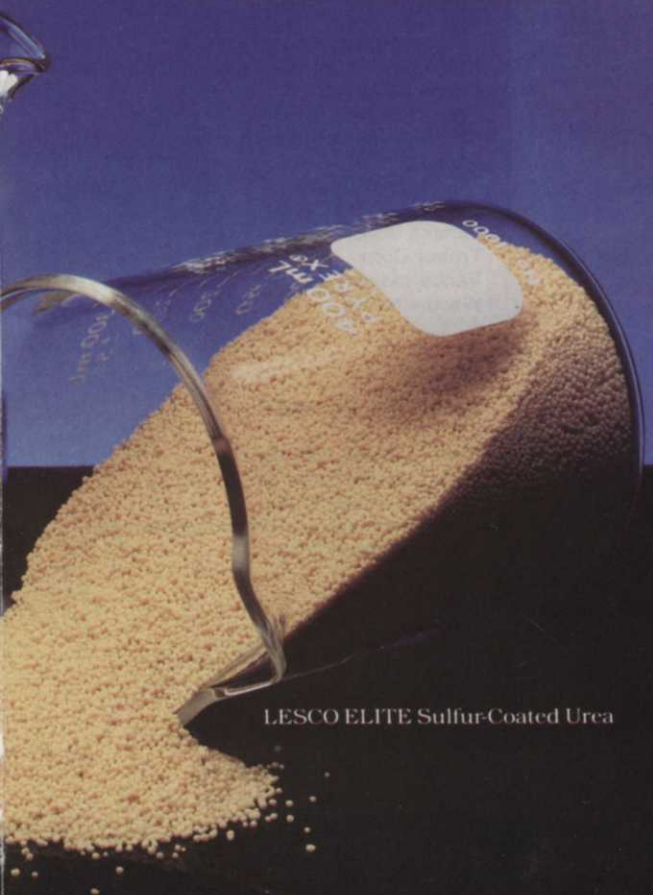

LESCO ELITE Sulfur-Coated Urea

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OK, Doug. What is it about Scotts new ProTurf 22-0-22 NK Fairway Fertilizer that makes it a high quality product? "We use only top quality ingredients. All the potassium is in the form of potassium sulfate. The nitrogen is balanced between quick- and slow- release forms. And each high-density particle is homogeneous... providing a consistent feeding."

What does that mean on a fairway? "Several things—quick greenup, a greening effect that lasts up to two months, even distribution of nutrients. Also, less chance of burning turf, the addition of sulfur to the soil, and no chloride salts."

And you say it's designed for fairways? "Yes. It's composed of large particles that throw a wide, even swath from a rotary spreader."

What benefits do I get from a high potassium feeding? "It's been shown that potassium will enhance turfgrass performance — better drought hardiness, improved disease resistance, more tolerance to wear, things like that. And studies on bermudagrass attribute reduced winterkill to high potassium."

Sounds like it would be hard to go wrong with ProTurf 22-0-22 NK Fairway Fertilizer. "That's right. It can be applied any time, and it's very versatile, too. You can use double rates spring and fall in the north and all summer in the south. Half rates are great for cool season grasses during the hot summer months."

Can you sum all that up, Doug? "ProTurf 22-0-22 NK Fairway Fertilizer is a great program complement to our regular Fairway Fertilizer at 32-3-10 and our High K Fairway Fertilizer at 15-0-30."

For more information on Scotts new ProTurf 22-0-22 NK Fairway Fertilizer, call your ProTurf Tech Rep. Or call Scotts direct at 800-543-0006. In Ohio, call collect (513) 644-2900.

Circle No. 149 on Reader Inquiry Card

"Superintendents have been talking about a high quality 1-0-1 product designed for fairways. We've been listening."

Doug Horn, Scotts Research project leader (Fertilizer R&D), talks about new **ProTurf 22-0-22 NK Fairway Fertilizer.**

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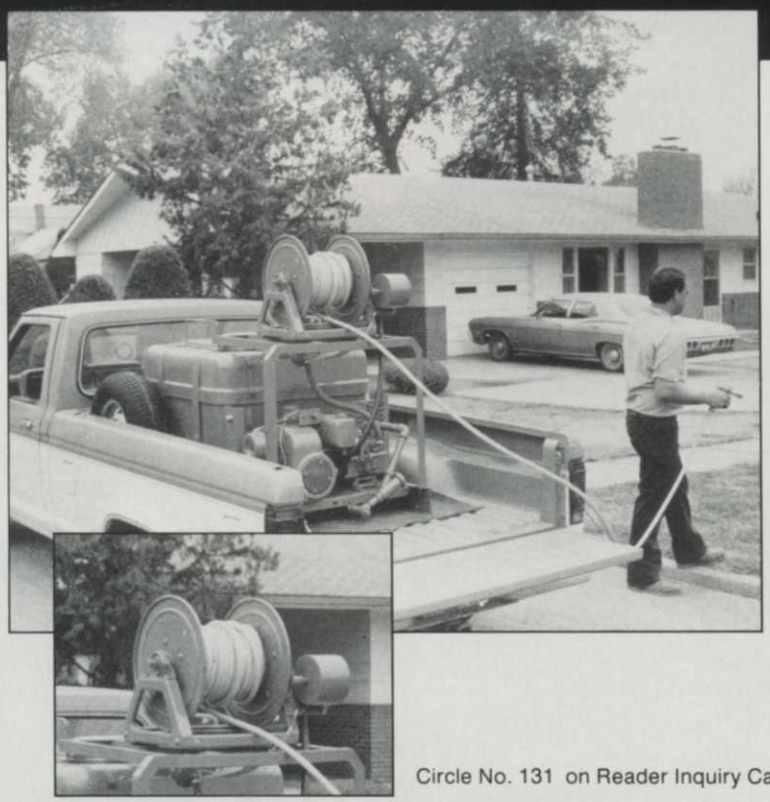
The Reel for Your Wheels



The Hannay Series 1500 Spray Reel

Whether you drive a custom-built truck or a pickup with a skid unit, or tow a trailer, the Hannay 1500 is the reel for your wheels. Professionals in lawn maintenance and pest control demand the day in, day out reliability of Hannay Reels. The smooth payout, the precise windup and the all-around convenience. Plus efficient storage that reduces wear on the hose and subsequent repair and replacement costs. Not only that, but chances are your Hannay Reel will last longer than your truck!

No matter what the size of your business, if you use hose, you need Hannay Reels. For more information on Hannay Reels or for a free Series 1500 feature sheet, circle the number below or call Hannay Reels today.

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HANNAY REELS

CLIFFORD B. HANNAY & SON, INC., 600 EAST MAIN STREET
WESTERLO, NEW YORK 12193 • TELEPHONE (518) 797-3791

CITATION II • BIRDIE II • MANHATTAN II

FERRY-MORSE GOLD TAG BRAND COVERS THE 1986 ROSE BOWL

The Rose Bowl at Pasadena, CA, January 1, 1986

New generation perennial ryegrasses provide 'near perfect' playing surface . . . prove older ryegrass varieties to be passé

PASADENA, CA – When the field turf management team for the Rose Bowl specified the perennial ryegrass blend to overseed the 1986 Classic, they chose Ferry-Morse Gold Tag Brand, a blend of Citation II, Birdie II and Manhattan II ryegrasses produced by Turf-Seed, Inc.

To meet demanding time and performance constraints, they opted to use this blend of genetically improved ryegrasses based on performance in prior testing against other varieties and combinations. Gold Tag Blend germinated and established quickly, producing a dark green, durable playing surface that enhanced the playing field graphics and the proud heritage of the Rose Bowl itself.

Based on comments and accolades bestowed in 1986, the turf management team anticipates the use of genetically improved ryegrasses like Citation II, Birdie II and Manhattan II, and Gold Tag Blend in the future.

And it looks like a very bright future, indeed.

The field still looked terrific the day after the game

Citation II, Birdie II and Manhattan II are products of

Turf-Seed, Inc.

PO Box 250, Hubbard, OR 97032
503/981-9571 TWX 510 590 0957

Gold Tag Brand is a product of

Ferry-Morse Seed Co.

PO Box 4938, Modesto, CA 97352
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International Reforestation Suppliers Inc
Son Shine Nursery

Nozzles & Accessories

Arizona Power Equipment Co
B & G Equipment Co
Broyhill Co
Buckner Irrigation
Chemilene Co
Delavan Corp
Encap Products Co
Ferguson Equipment & Supply
FMC Corp
Friend Mfg Corp
Gilmour Mfg Co
James Hardie Irrigation
Hydro Rain
Hypro Div Lear Siegler Inc
Kuker Industries Inc
Lesco Inc
Liqui*Lawn Corp
Melnor Industries
Micron Corp
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
D B Smith & Co
Son Shine Nursery
Sorensen Sprayers Inc
Spraying Devices Inc
Strong Ent Inc
Thorco/Master Sprayers
Tri-Con Inc
Westheffer Co

Patio & Walkway Materials

Ozark Landscaping Products

Picnic Tables

American Playground Device Co
Architectural Precast Inc
BigToys
Columbia Cascade Lumber Co
Kay Park Rec Corp
Miracle Recreation Equipment Co
Playworld Systems
Trojan Playground Equipment Mfg Co

Pipe

Advanced Drainage Systems Inc
Comanche Steel Products Inc
Hancor Inc
Lesco Inc
Pro-Turf Mfg Inc
Son Shine Nursery
Westheffer Co

Planters

Architectural Precast Inc
BigToys
Bouldin & Lawson Inc
Clean City Squares Inc
Deep Root Corp
Deere & Co
Ellis Mfg Co
International Harvester Co
Lesco Inc
Miracle Recreation Equipment Co
L J Rench & Co

Plants & Trees

L J Rench & Co
Son Shine Nursery

Play Structures

American Playground Device Co
BigToys
Columbia Cascade Lumber Co
Delmer F Harris Co
Landscape Structures Inc
Miracle Recreation Equipment Co
Playworld Systems
Trojan Playground Equipment Mfg Co

Plows, Sand Trap

Steiner Corp
United Farm Tools Inc

Pools, Decorative

L J Rench & Co

Post Drivers

McMillen Div
Rhino Sales Corp
Shaver Mfg Co
Worksaver Inc

Post Hole Diggers

Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Arizona Power Equipment Co
Bingham Equipment Co
Bush Hog
Howard S Crane Inc
Feldmann Engineering & Mfg Co
Ford Tractor Operations
Hoffco Inc/Comet Industries
Karl Kuemmerling Inc
Massey-Ferguson
McMillen Div
Rhino Sales Corp
Don Savage Co
Seymour Mfg Co
Shaver Mfg Co
Solo Inc
Tanaka USA
Union Fork & Hoe Co
Worksaver Inc

You Cannot Replace Lost Time!

We know your time is valuable. Grasshopper is designed to save mowing time. Depend on it day after day on every job.

CLOSE-QUARTER MOWING— Our out-front rotary for full view mowing and unsurpassed trimming capabilities, coupled with hydrostatic power offers true zero-turning maneuverability around obstacles and especially in tight spots.

EASY OPERATION—Two steel levers do it all . . . controlling speed, direction and braking. It is natural and easy to learn. There are no gears or clutch to slow you down and dual transmissions send power independently to each drive wheel for traction when you need it.

MUSCLE FOR THE ROUGH CUT— Grasshopper muscle means decks that are constructed of 10 gauge steel and reinforced with an additional steel plate around the spindle housings. A 1" blade spindle shaft is another example of how Grasshopper keeps cutting in tough mowing.

"QUIK-D-TATCH"® VACUUM— Vacuum the turf for a fine manicured cut. High capacity vacuum picks up wet grass clippings; even debris from dethatching. Write and ask us about our variety of attachments.

DEALER SUPPORTED—Get a quote from your local Grasshopper dealer. The low initial investment, inexpensive maintenance, and parts back-up make the Grasshopper an even more attractive addition to your mowing fleet.

The New Grasshopper Model 1822 Diesel

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Circle No. 129 on Reader Inquiry Card

Pressure Gauges

Best Way Inc
Broyhill Co
Encap Products Co
FMC Corp
Friend Mfg Corp
James Hardie Irrigation
Irrometer Co
Kuker Industries Inc
Lesco Inc
Northeast Industries Inc
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Southern Mill Creek Products Co
Spraying Devices Inc
Strong Ent Inc
Thorco/Master Sprayers
Tuflex Mfg Co
Westheffer Co

Pruners, Hedge

Allegheny International Hardware Group
American Standard Co
Ames Lawn & Garden Tool Co
Arizona Power Equipment Co
Asplundh Safety Equipment Co
Bartlett Mfg Co
Chisholm-Ryder Co
Corona Clipper Co
Deere & Co
Echo Inc
Emblidge Corp
Fairmont Railway Motors
Gilmour Mfg Co
Green Machine Div HMC
International Reforestation Suppliers Inc
Karl Kuemmerling Inc
Rain Bird Sprinkler Mfg Corp
O M Scott & Sons Co
Seymour Smith & Son Inc
Stanley Hydraulic Tools
Union Fork & Hoe Co

Pruners, Tree

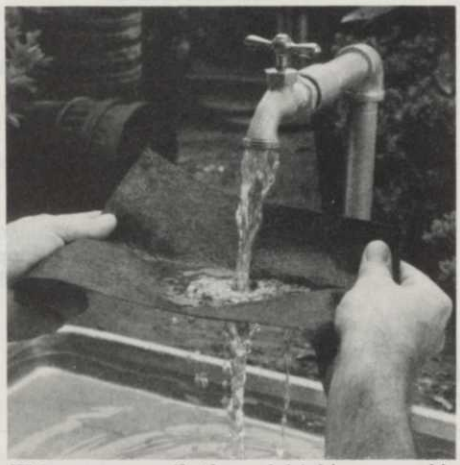
Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Arizona Power Equipment Co
Bartlett Mfg Co
Chisholm-Ryder Co
Citrus Systems Inc
Corona Clipper Co
Deere & Co
Echo Inc
Emblidge Corp
Fairmont Railway Motors
Fanno Saw Works
Friend Mfg Corp
Gilmour Mfg Co
Green Machine Div HMC
International Reforestation Suppliers Inc
Jameson Corp
Karl Kuemmerling Inc
H K Porter Inc
Rain Bird Sprinkler Mfg Corp
L J Rench & Co
O M Scott & Sons Co
Seymour Smith & Son Inc
Stanley Hydraulic Tools
Union Fork & Hoe Co

Pumps

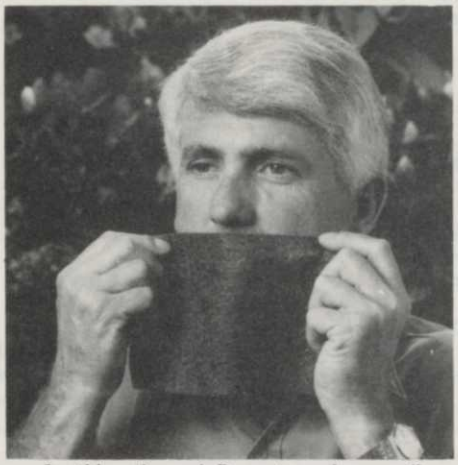
Ag-Rain Inc
AquaTurf
Arizona Power Equipment Co
Best Way Inc
Bowie Industries Inc
Broyhill Co
Clinton Engines Corp
Earth Energy Systems Inc
Encap Products Co
Ferguson Equipment & Supply
FMC Corp
Franklin Electric
Hanson-General Prod Corp
Homelite Div Textron Inc
Hydroflo Corp
Hypro Div Lear Siegler Inc
International Reforestation Suppliers Inc
Jaeco Pump Co
Kembro Inc
Kubota Tractor Corp
Kuker Industries Inc
Little Giant Pump Co Sub Tecumseh Prods Co

Circle No. 133 on Reader Inquiry Card

THIS TEST WON'T HOLD WATER —OR AIR.



Water passes easily through highly permeable Duon Weed Control Mat.



Just blow through Duon to see how easily air passes through it.

The proof is stronger, longer lasting plants with DUON® Weed Control Mat.

Both water and air pass easily through Duon Weed Control Mat, made of Phillips Fibers nonwoven polypropylene. As a landscaper, you know how important that is to a plant's root system and to the future well-being of your big landscape jobs—especially those you use as references.

When water and air can't get through, plants die. Black plastic won't work for the long-term. And woven polypropylenes are nowhere near as permeable as nonwovens. For example, the air permeability for nonwoven Duon is about 14 times greater than for woven polypropylenes and the water permeability for Duon is about 10 times greater.

Put our words to the test. Hold Duon under running water, then take another piece and breathe through it. Then try the same test with a competitive weed control mat.

When covered from sunlight, Duon is virtually permanent. It allows plants to thrive and impedes about 95% of weed growth (in most areas). It also keeps mulch from going down into the soil.

For your quality landscape jobs, order Duon. For further information, call Phillips Fibers (803) 242-6600.

MARKETED THROUGH:
Blunk's
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Bridgeview, IL 60455
(312) 430-2025

PHILLIPS 66

PHILLIPS FIBERS CORPORATION
A SUBSIDIARY OF PHILLIPS PETROLEUM COMPANY
TEXTILE NONWOVEN FABRICS MARKETING
P. O. BOX 66, GREENVILLE, SC 29602
(803) 242-6600

*Trademark Phillips Petroleum Company

Circle No. 155 on Reader Inquiry Card

McCulloch Corp
Minnesota Wanner Co
F E Myers Co
PBI-Gordon Corp
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Shindaiwa Inc
Smithco Inc
Smithco
Solo Inc
Son Shine Nursery
Sorensen Sprayers Inc
Spraying Devices Inc
Strong Ent Inc
Tanaka USA
Tecumseh Products Co
Thorco/Master Sprayers
Tuflex Mfg Co
Westheffer Co
Winkler Hydraulics

Rakes, Landscape

Agrotec Inc
Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Arthur Enterprises Inc
Bartlett Mfg Co
Bingham Equipment Co
E-Z Rake Inc
Ford Tractor Operations
Glenmac Inc
Kenyon Mfg Inc
Karl Kuemmerling Inc
Lesco Inc
Roseman Mower Corp
Rugg Mfg Co
Sensation Div Gilson
Standard Golf Co
Union Fork & Hoe Co
York Modern Corp

Rain Sensors

Dayni Controls Mfg Co
Telsco Industries (Weather-Matic)

Rock Pickers

Bingham Equipment Co
Howard S Crane Inc
Glenmac Inc
KEM Enterprises
Son Shine Nursery
Vermeer Mfg Co

Rollers, Lawn

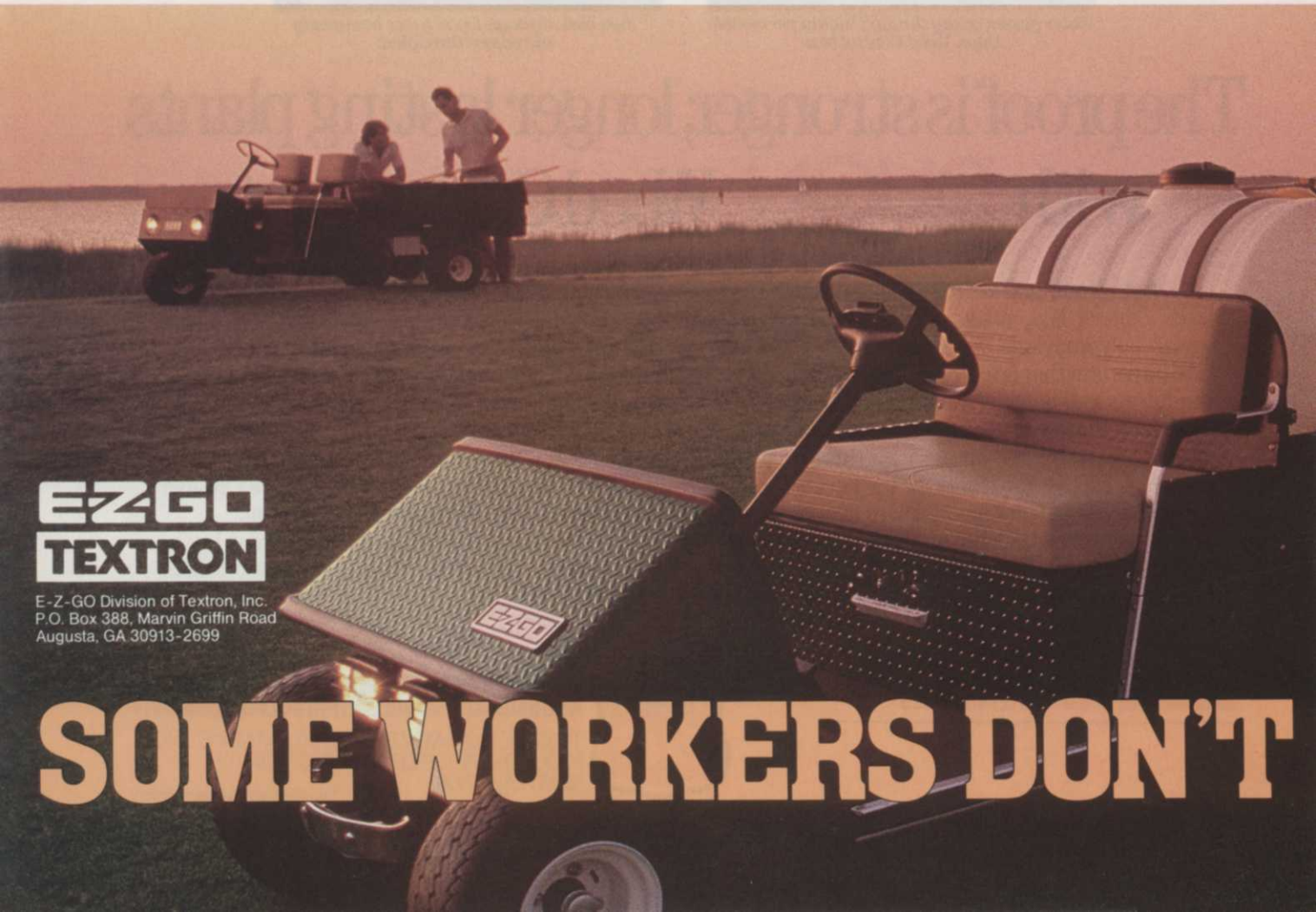
Aer-Way
Allegheny International Hardware Group
Arizona Power Equipment Co
Brouwer Turf Equipment Ltd
Gandy Co
Northeast Industries Inc
Robush Engineering Co
Ryan Turf/OMC Lincoln
White Outdoor Products Co

Rope

Asplundh Safety Equipment Co
Bartlett Mfg Co
Karl Kuemmerling Inc
Lambeth Corp
Lesco Inc
Power Lawnmower Parts Inc
Samson Cordage Works
Standard Golf Co

Safety Wear & Equipment

Asplundh Safety Equipment Co
Bartlett Mfg Co
Custom Products of Litchfield Inc
Deere & Co
Echo Inc
Edmont Div Becton Dickinson & Co
Ferguson Equipment & Supply
International Reforestation Suppliers Inc
Karl Kuemmerling Inc
Lesco Inc
McCulloch Corp
Moyer & Son Inc
Racal Airstream Inc



Tecfor Inc
Westheffer Co

Saws

AEG Power Tool Corp
Allegheny International Hardware Group
Arizona Power Equipment Co
Asplundh Safety Equipment Co
Bartlett Mfg Co
Deere & Co
Fairmont Railway Motors
Fanno Saw Works
Gilmour Mfg Co
Jameson Corp
Karl Kuemmerling Inc
Milwaukee Electric Tool Corp
Skil Corp

Scrapers

Allegheny International Hardware Group
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Deere & Co
Industrial Leasing Corp
International Harvester Co
Massey-Ferguson
York Modern Corp

Screeners

Laval Corp Claude
Lindig Mfg Corp
Royer Foundry & Machine Co

Seeders

Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Arizona Power Equipment Co
Bowie Industries Inc
Brillion Iron Works Inc
Brouwer Turf Equipment Ltd
Bush Hog
Cushman-Ryan/OMC Lincoln
Deere & Co
Gandy Co
Herd Seeder Co
Industrial Leasing Corp
Olathe Mfg Inc
Salsco Inc
Vandermolen Corp
Vicon Farm Machinery Inc
Weldco (WA) Inc
Worksaver Inc

Seeders, Hydraulic

Bowie Industries Inc
Brillion Iron Works Inc
Cushman-Ryan/OMC Lincoln
Finn Corp
Industrial Leasing Corp
Thermoguard Co
Weldco (WA) Inc

Sharpeners

Earl J Crane Inc
Foley-United Co
International Reforestation Suppliers Inc

Shears

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Arthur Enterprises Inc
Bartlett Mfg Co
Corona Clipper Co
International Reforestation Suppliers Inc
Milwaukee Electric Tool Corp
Rain Bird Sprinkler Mfg Corp
Seymour Smith & Son Inc
Seymour Smith & Son Inc

Shelters

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Miracle Recreation Equipment Co
Playworld Systems
W H Porter Inc Poligon/Cover-All Div
Western Wood Structures Inc

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International Reforestation Suppliers Inc
Kenyon Mfg Inc
Lesco Inc
Rugg Mfg Co
Son Shine Nursery
Union Fork & Hoe Co

Snow Blowers

American Honda Motor
Ariens Co
Beaird-Poulan/Weed Eater
Roscoe Brown Corp
Bunton Co
J I Case
Howard S Crane Inc
Cushman-Ryan/OMC Lincoln
Deere & Co
Ford Tractor Operations
Grasshopper Co
Gravely International Inc
Green Machine Div HMC
Haban Mfg Co
Hanson-General Prod Corp
Henderson Mfg
Hoffco Inc/Comet Industries
Homelite Div Textron Inc
Ingersoll Equipment Co
International Harvester Co
Kubota Tractor Corp
Massey-Ferguson
MTD Products Inc
Sensation Div Gilson
Simplicity Mfg Inc
Snapper Products Equipment
Steiner Corp
Toro Co Commercial Prods Div
United Farm Tools Inc
White Outdoor Products Co

Snow Plows

Ariens Co
Bomford & Evershed Ltd
J I Case
Earl J Crane Inc
Deere & Co
Gravely International Inc
Guest Industries Inc
Haban Mfg Co
Ingersoll Equipment Co
International Harvester Co
Swenson Spreader Co
United Farm Tools Inc
Western Products
White Outdoor Products Co

Sod Cutters

Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Brouwer Turf Equipment Ltd
Earl J Crane Inc
Cushman-Ryan/OMC Lincoln
Ryan Turf/OMC Lincoln
Turfco Mfg Inc
Union Fork & Hoe Co
Young Industries

Sod Equipment

Brouwer Turf Equipment Ltd
Deere & Co
Jerry Clipper
New Holland

Sod Harvester

Brouwer Turf Equipment Ltd
Princeton Mfg Co

Sod Planters

Soil Compactors

Soil Fumigation

Hendrix & Dail Inc

Soil Mixers

Bouldin & Lawson Inc
Roscoe Brown Corp
Lindig Mfg Corp
Royer Foundry & Machine Co
Son Shine Nursery
Vandermolen Corp
Worksaver Inc

Soil Moisture Sensing Equipment

Howard S Crane Inc
Dayni Controls Mfg Co
James Hardie Irrigation
International Reforestation Suppliers Inc
Irrometer Co
Rain Bird Sprinkler Mfg Corp
Soilmoisture Equipment Corp
Sudbury Lawn & Garden Products

Soil Sampler

Clements Associates Inc
International Reforestation Suppliers Inc
LaMotte Chemical Products Co
Lesco Inc
P E Skaling Soilmoisture Equipment Corp
Soilmoisture Equipment Corp
Turfgrass Products Corp
Westheffer Co

Soil Shredders

Lindig Mfg Corp
Royer Foundry & Machine Co

Soil Test Labs

Hach Co
Orbeco Analytical Systems Inc
Sudbury Lawn & Garden Products

Soil Test Meters

Kel Instruments Co
Karl Kuemmerling Inc
LaMotte Chemical Products Co
Lesco Inc
P E Skaling Soilmoisture Equipment Corp
Sudbury Lawn & Garden Products
Terracare Products Co

Sprayers

Agrotec Inc
Applied Biochemists Inc
Arborchem Products Co
Arizona Power Equipment Co
Bartlett Mfg Co
Best Way Inc
B & G Equipment Co
Bingham Equipment Co
John Blue Co
Broyhill Co
Buffalo Turbine Agricultural Equip Co
Bush Hog
Carmel Chemical Corp
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Citrus Systems Inc
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Cushman-Ryan/OMC Lincoln
Deere & Co
Echo Inc
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Finn Corp
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Gilmour Mfg Co
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Jonathan Green Inc
Green Machine Div HMC
Hahn Inc
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H D Hudson Mfg Co
Industrial Leasing Corp
International Reforestation Suppliers Inc
Kuker Industries Inc
Lesco Inc
Liqui*Lawn Corp
Marco Div of Llo-Mar Mfg Inc
Master Mfg Co
Melnor Industries
Micron Corp
F E Myers Co
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Richardson Great Northern Mfg Inc
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RIGO Co
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Sidefire Inc
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Smithco Inc
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Smithco
Solo Inc
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Spraying Devices Inc
Strong Ent Inc

HOW TO TELL IF YOUR COMMERCIAL MOWER IS BUILT FOR A LONG LIFE

There is a simple way to be sure your commercial mower is designed for a long life, and is built to achieve it.

Buy Bunton

to be sure your mowers have welded one-piece steel construction, lubrication points at each moving part, pneumatic puncture resistant tires and more.

Specify 2-cycle

for an engine that often provides 4 seasons of hard commercial use without major maintenance (2 season warranty), as much torque from an 8 hp as with an 11 hp 4-cycle, the piece of mind provided by taking the critical engine lubrication function out of the hands of your operators, and *a cost competitive with the most popular 4-cycle engines.*

Use the System

that puts your key equipment on the same fuel/oil mixture, with Bunton trimmers, backpack blowers and mowers.

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Bunton builds 'em better.

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Telex: 204-340

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Circle No. 110 on Reader Inquiry Card

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Trebor Corp
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Vandermolen Corp
Vicon Farm Machinery Inc
Westheffer Co
Wheel Spray Corp

Sprayers, Measuring Equipment

Ferguson Equipment & Supply
FMC Corp
Green Pro
Hanson-General Prod Corp
Lesco Inc
Marco Div of Llo-Mar Mfg Inc
Micro-Trak Systems
Moyer & Son Inc
Pro-Turf Mfg Inc
Southern Mill Creek Products Co

Spray Guns

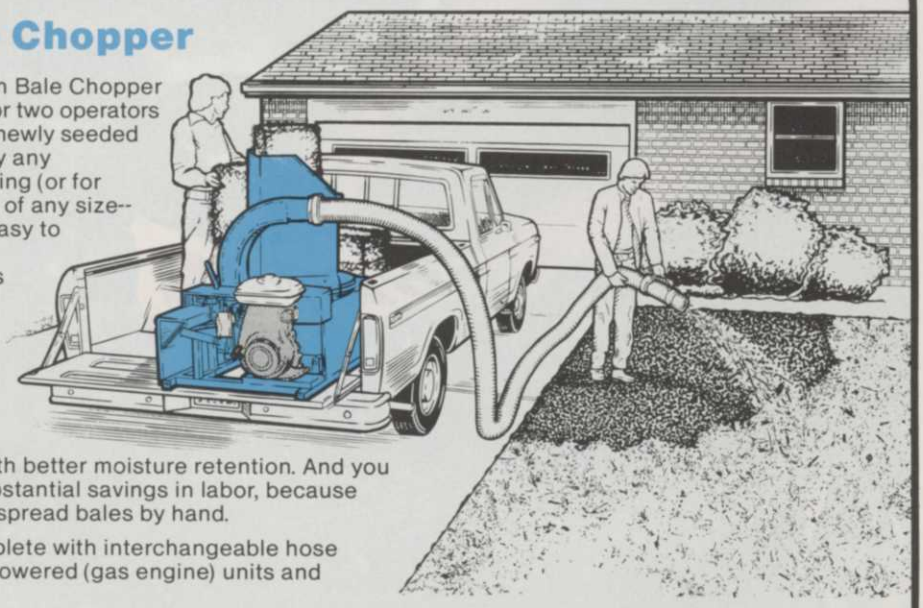
Agrotec Inc
Arborchem Products Co
Arizona Power Equipment Co
B & G Equipment Co
Broyhill Co
Chemilene Co
Citrus Systems Inc
Cushman-Ryan/OMC Lincoln
Encap Products Co
Ferguson Equipment & Supply
FMC Corp
Friend Mfg Corp
Great Northern Equipment Co
Hanson-General Prod Corp
Hypro Div Lear Siegler Inc
Kuker Industries Inc
Lesco Inc
Marco Div of Llo-Mar Mfg Inc
F E Myers Co
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Richardson Great Northern Mfg Inc
Root-Lowell Corp
Smithco Inc
Smithco
Southern Mill Creek Products Co
Spraying Devices Inc
Strong Ent Inc
Thorco/Master Sprayers
Tri-Con Inc
Tuflex Mfg Co
Westheffer Co

Spray Units

Agrotec Inc
Angus Sprayers
Arborchem Products Co
Arizona Power Equipment Co
Best Way Inc
B & G Equipment Co
Broyhill Co
Carmel Chemical Corp
Chemilene Co
Citrus Systems Inc
Cushman-Ryan/OMC Lincoln
Dedoes Industries Inc
Ferguson Equipment & Supply
FMC Corp
Friend Mfg Corp
Great Northern Equipment Co
Hahn Inc
Hanson-General Prod Corp
Kuker Industries Inc
Lesco Inc
Marco Div of Llo-Mar Mfg Inc
Minnesota Wanner Co
F E Myers Co
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Richardson Great Northern Mfg Inc
Siebring Mfg Co
Smithco Inc
D B Smith & Co
Smithco
Southern Mill Creek Products Co
Spraying Devices Inc
Strong Ent Inc
Thorco/Master Sprayers
Tri-Con Inc
Tuflex Mfg Co
Westheffer Co
Wylie Sprayers

THE MULCHING SOLUTION

The Goossen Bale Chopper



In the field since 1982, the Goossen Bale Chopper is a proven machine which lets one or two operators lay down an even layer of mulch on newly seeded lawns. It chops and spreads virtually any material that can be used for mulching (or for composting!). And the lawns can be of any size--the Bale Chopper is compact and easy to maneuver in even the smallest residential applications. That makes it a very efficient and practical machine for landscaping.

The ***Landscapers' answer*** to the problem of clumps and gaps in mulching coverage, the Bale Chopper gives you even-blanket coverage for better germination, with better moisture retention. And you get this excellent coverage at a substantial savings in labor, because you eliminate the need to tear and spread bales by hand.

The Bale Chopper is available complete with interchangeable hose and directional spout, in both self-powered (gas engine) units and tractor-hitch PTO models.

Call right now and let us show you how the Goossen Bale Chopper can save you time and money!

Toll Free 800-228-6542
In Nebraska, (402) 228-4226

Goossen INDUSTRIES
927 West Court St. • P.O. Box 705 • Beatrice, Nebraska 68310

Circle No. 128 on Reader Inquiry Card

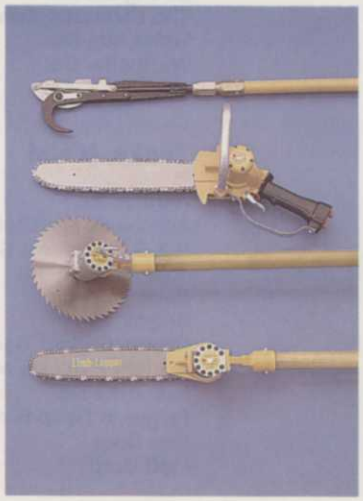
While nobody was looking, Fairmont developed a Limb Lopper power pack that lets you trim branches quietly without being tied to your truck.

A hundred feet or a hundred yards. Distances no longer matter with the quiet, self-contained mobile hydraulic power pack from Fairmont.

This compact, highly portable unit weighs just 53 pounds. It supplements the hydraulic outlets on your truck to let you do ground and ladder trimming beyond your truck's normal 25-foot hose limit. Best of all, it works with the tools that you're already using in your basket.

The practical benefits of Limb Lopper's mobile power pack are obvious. No longer do you have to equip each truck with manual and gasoline-powered tools for jobs that a basket can't reach. One set of quiet, efficient hydraulic tools takes care of every tree-trimming job.

Many of the big commercial tree-trimming companies have already switched to Limb Lopper chain saws, circular saws, and shade-tree pruners. It's easy for you to do the same. Just phone or visit your nearest member of Fairmont's trained, dependable Limb Lopper dealer network. Or write: Fairmont Hydraulics, a division of Fairmont Railway Motors, Bldg. B, Suite 408, 800 Roosevelt Road, Glen Ellyn, IL 60137. Phone (312) 790-1690.



Limb Lopper

Fairmont®

Fairmont Hydraulics
Division of Fairmont Railway Motors

A DIVISION OF harsco CORPORATION

Circle No. 124 on Reader Inquiry Card

Spray Units, Mixer Proportioners

Broyhill Co
Ferguson Equipment & Supply
Gilmour Mfg Co
Great Northern Equipment Co
Hanson-General Prod Corp
Kuker Industries Inc
Marco Div of Llo-Mar Mfg Inc
Moyer & Son Inc
Power Spray Technology Inc
Siebring Mfg Co
Young Industries

Spreaders

Allegheny International Hardware Group
Ames Lawn & Garden Tool Co
Arizona Power Equipment Co
John Blue Co
Brinly-Hardy Co
Bunton Co
Bush Hog
Central Quality Industry Inc
Country Mfg Inc
Cushman-Ryan/OMC Lincoln
Deere & Co
Gandy Co
Jonathan Green Inc
Hahn Inc
Highway Equipment Co
Industrial Leasing Corp
Lesco Inc
Locke Mfg Inc
PBI-Gordon Corp
Precision Products Inc
PSB Co
O M Scott & Sons Co
Seymour Mfg Co
Sta-Green Plant Food Co
Swenson Spreader Co
Vandermolen Corp
Vicon Farm Machinery Inc
Warren's Turf Nursery Inc
Western Products
Wheel Spray Corp
Worksaver Inc

Sprig Planters

Straw Blowers

Howard S Crane Inc
Finn Corp
Reinco Inc

Stump Cutters

Burkeen Mfg Co
Chipmore Mfg Co
Howard S Crane Inc
Heckendorn Mfg Co
Karl Kuemmerling Inc
Lindig Mfg Corp
Olathe Mfg Inc
Promark Products Inc
Rayco Mfg Inc
Sidefire Inc
Vermeer Mfg Co
Winkler Hydraulics

Sweepers

Arizona Power Equipment Co
Atwater Strong Div
Billy Goat Industries
Bingham Equipment Co
Brinly-Hardy Co
Bunton Co
J I Case
Country Mfg Inc
Giant Vac Mfg Inc
Grasshopper Co
Industrial Leasing Corp
Ingersoll Equipment Co
Mathews Co
MTD Products Inc
Olathe Mfg Inc
Precision Products Inc
Steiner Corp
Sweepster Jenkins Equipment Co
Tennant Co
Toro Co Commercial Prods Div
Turf Vac Corp

Sweepers, Water

Sweepster Jenkins Equipment Co

Tanks, Fiberglass

Arizona Power Equipment Co
Best Way Inc
Broyhill Co
Fiberglass Unlimited Inc
FMC Corp
Friend Mfg Corp
Hydroflo Corp
Jaeco Pump Co
Kay Park Rec Corp
Kuker Industries Inc
Marco Div of Llo-Mar Mfg Inc
Moyer & Son Inc
PBI-Gordon Corp
Pex Inc
Power Spray Technology Inc
Pro-Turf Mfg Inc
Raven Industries Inc
Smithco Inc
Smithco
Sorensen Sprayers Inc
Spraying Devices Inc
Strong Ent Inc
Thorco/Master Sprayers
Tuflex Mfg Co
Westheffer Co

Tanks, Metal

Agrotec Inc
Arizona Power Equipment Co
B & G Equipment Co
John Blue Co
Bock Products
Broyhill Co
Clinton Engines Corp
Custom Products of Litchfield Inc
Fabridyne Inc
Ferguson Equipment & Supply
Finn Corp
FMC Corp
Friend Mfg Corp
Great Northern Equipment Co
Hydroflo Corp
Jaeco Pump Co
Kay Park Rec Corp
Minnesota Wanner Co
Pro-Turf Mfg Inc
Son Shine Nursery
Westheffer Co
Winkler Hydraulics

Tanks, Polyethylene

Agrotec Inc
Best Way Inc
Ferguson Equipment & Supply
Hancor Inc
Hanson-General Prod Corp
Hydroflo Corp
Kuker Industries Inc
Moyer & Son Inc
Pex Inc
Pro-Turf Mfg Inc
Raven Industries Inc
Richardson Great Northern Mfg Inc
Smithco
Strong Ent Inc
Westheffer Co

Tillers

Snapper Products Equipment

Tillers, Tractor-Mounted

Bingham Equipment Co
Bush Hog
Deere & Co
Gravely International Inc
Howard Rotovator Co
Industrial Leasing Corp
Ingersoll Equipment Co
Kubota Tractor Corp
MTD Products Inc
Sensation Div Gilson
Simplicity Mfg Inc
White Outdoor Products Co
Woods Div Hesston Corp

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Chemilene Co
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Hi-Ranger Inc
Milwaukee Electric Tool Corp
Nevr-Rust Tool-Tainer Inc
Pro-Turf Mfg Inc
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Winkler Hydraulics

Topdresser

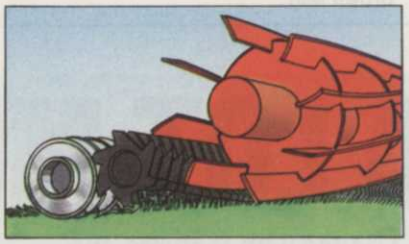
Cushman-Ryan/OMC Lincoln
Turfco Mfg Inc
Vicon Farm Machinery Inc

Stroke for stroke, the best in the business.

Greens King® IV Diesel.

Now, you can approach the green with the finest tournament-quality triplex greens mower and cut your fuel costs virtually in half. Because the innovative Jacobsen Greens King family introduces another industry first: *Diesel*.

The new 16½-hp. diesel Greens King IV provides more power for climbing and cutting. Plus, this diesel model has many standard features you'll only find as options elsewhere. Like full floating and pivoting reel units that steer through turns without scuffing or marking; full hydraulic drive with dynamic braking for greater control: just let up on the pedal to slow down; and, variable speed control which allows the operator to select the precise ground speed and frequency of cut for greens while still allowing full speed for transport.



By cutting horizontal runners and removing thatch, the patented Turf Groomer™ attachment creates faster, truer and healthier greens *without* lowering height of cut.

If you prefer a gas engine, both 14-hp. and 16-hp. models are available. Giving you the broadest selection of riding greens mowers in the industry. With more options, to help you meet your greens care needs more precisely.

Like the revolutionary, patented Turf Groomer™ attachment for faster, truer greens. *Without* lowering height of cut.

And, the unique *performance monitor* which digitally displays all speeds, including cutting frequency, so the operator can evaluate mowing performance, instantly.

What's more, every Greens King is backed by the most extensive support network in the industry. So, contact your Jacobsen distributor to arrange a free demonstration. And see for yourself why the Greens King family is the best in the business.

Lease and finance plans available. Jacobsen Division of Textron Inc., Racine, WI 53403. Telex: 264428.

Greens King and Turf Groomer are trademarks of Jacobsen Division of Textron.

JACOBSEN TEXTRON

Jacobsen Division of Textron Inc.

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Topdressing Brush

Standard Golf Co

Tractors & Attachments

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Westheffer Co

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CUT A LOT MORE TURF

Loaded with features, the newest generation of highly maneuverable Power Quint mowers virutally guarantee you decades of the finest turf care with even small PTO-equipped tractors. Adjustable reels work against heavy duty bedknives in individual cutting units that truly float over uneven terrain. And when the job's finished, this

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SINCE 1919

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ASK ABOUT OUR NEW VERTI-CUT UNITS!

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Lesco Inc
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E-Z-Go Textron
Hahn Inc
Carl Heald Inc
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K-D Manitou Inc
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WITH LESS TRACTOR

11½′ unit folds up its outboard reels automatically for easy trailering and storage.

For all the details and a free demonstration, call or write today for the name of the dealer nearest you.

National Mower Company
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St. Paul, Minnesota 55114
612/646-4079.
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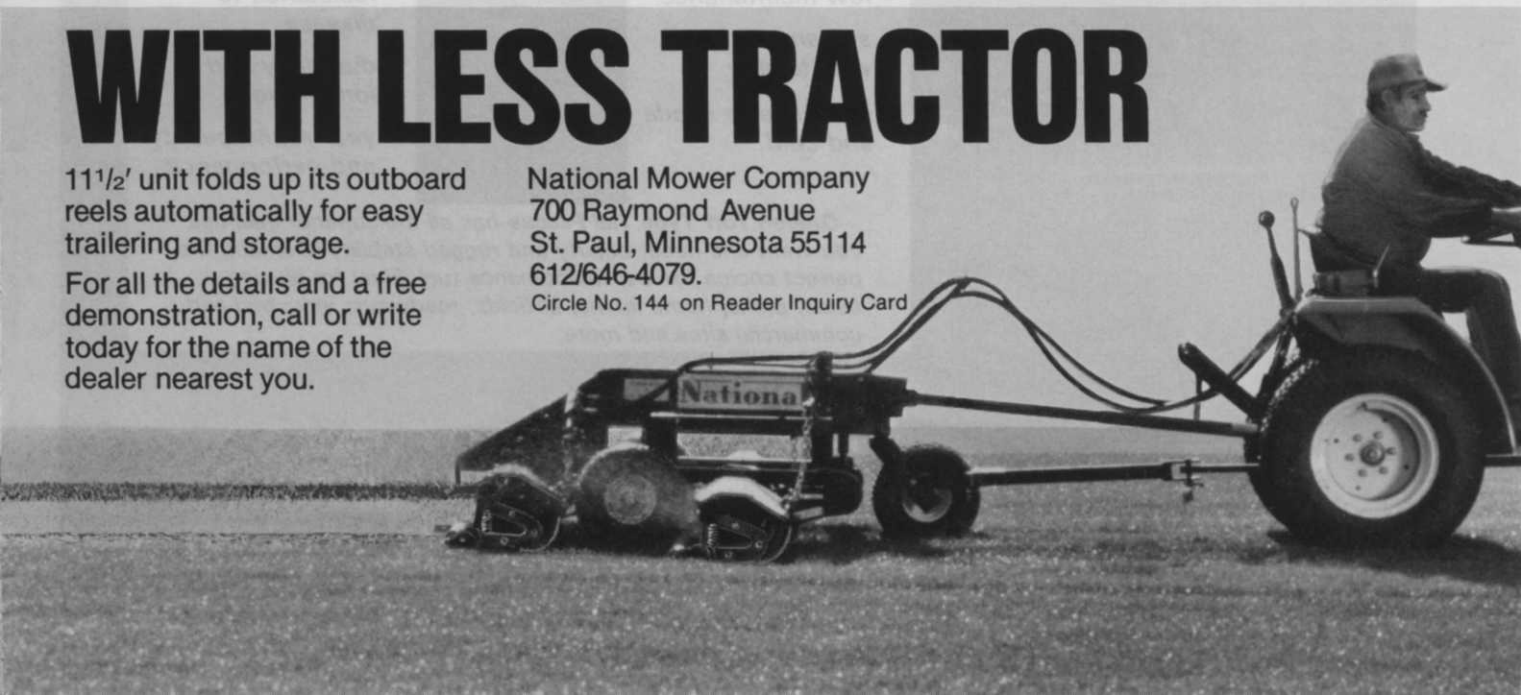

A cut above.

A professional cut.
The 48" Exmark mower's popular V-design deck makes this mower easy to handle and new adjustable pin casters allow quick height adjustments. The professional cut is turning heads across the nation.

A profitable cut.
Precision engineering, rigorous testing and exacting production procedures mean that all Exmark products, from the sleek 48" to the powerful Turf Rake, will give you years of profitable operation. Combine Exmark's quality and excellent pricing and you get lawn care equipment that's a cut above the competition.

For the dealer nearest you, call Exmark today: **402/223-4010.**

eXmark®
MFG. CO. INC.
BOX 748, BEATRICE, NE 68310

The mark of quality in professional lawn care.

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Equipment
continued

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Charles Machine Works Inc
Turfco Mfg Inc
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Best Way Inc
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NEW TURF-TYPE TALL FESCUES

Now, more than ever the choice of professionals.

Join the rapidly growing number who select Tall Fescue for:

- *rich, dark green dense turf*
- *low maintenance*
- *soil and climate adaptability*
- *tolerance to shade and cold*

- *tolerance to heat and drought*
- *resistance to disease*
- *durability and longer wear*
- *year-round beauty and performance*

***Oregon Turf Type Tall Fescue** has all the superior qualities you want and need: beauty and rugged stability. Demand the perfect choice for low maintenance turf, ideal for playing fields, parks, home lawns, airfields, roadways, industrial and commercial sites and more.*

For more information contact your seed dealer, or write to:

OREGON TALL FESCUE COMMISSION
2140 Turner Rd. SE., Salem, Oregon 97302
Phone (503) 585-1157

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110 KINDS OF PLANTS. 43 TYPES OF INSECTS. 1 SPRAY.

You're looking at a picture, not of a place, but of an idea: ORTHENE® Tree and Ornamental Spray, and why it means so much to professional gardeners, nurserymen, arborists and golf course superintendents.

ORTHENE offers blanket protection against an amazing variety of insect pests. It's cleared for use on a long list of trees and plants, from orchids to roses to ponderosa pine, even for turf. Cleared last year for use against turf insects, ORTHENE* has just been okayed for mole crickets in Florida—the main enemy of professionals' healthy greens and fairways.

By using ORTHENE, one spray lets you kill pests like tent caterpillars, whiteflies, Japanese beetles and thrips on contact. Plus it provides lasting residual action against other insects from aphids to scale crawlers to sod webworms. It's a great way to make the whole job of protecting flowers, trees and turf simpler, and more effective.

If you're a professional in the plant care industry, ORTHENE can actually make it easier to do a better job of protecting plants. You ought to know more about it. To find out, send in this coupon.

*ORTHENE 75 S Soluble Powder (Florida SLN).

Avoid accidents: For safety, read the entire label including precautionary statements. Use all chemicals only as directed. Copyright © 1985 Chevron Chemical Company. All rights reserved.

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Chevron

ORTHO

Chevron Chemical Company

Mail to:
Lee Sutherland
Chevron Chemical Company
575 Market Street
San Francisco, CA 94105

Please send me more information on ORTHENE.

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Company

Street Address

City

State Zip

2. Equipment Companies

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Columbus OH 43221
614-457-3051

AEG Power Tool Corp
One Winnenden Rd
Norwich CT 06360
800-243-0870

Aer-Way
20 Phoebe St
PO Box 339
Norwich ON CN
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519-863-3414

Ag-Rain Inc
600 S Schrader
Havana IL 62644
309-543-4425

Ag-Share Computer Systems Inc
3334 Sheridan Blvd
Denver CO 80212
303-455-8734

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11150 W Addison
Franklin Park IL 60131
312-455-6900

Agrotec Inc
PO Box 49
Pendleton NC 27862
919-585-1222

Alamo Group
PO Box 549
Sequin TX 78156-0549
512-379-1480

Algoma Net Co
1525 Mueller St
Algoma WI 54201
414-487-5577

Allegheny International Hardware Group
465 Railroad Ave
PO Box 3500
Shiremanstown PA 17011
717-737-1500

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PO Box 10264
Birmingham AL 35202
205-969-3400

American Continental Products
Box 280
Willmar MN 56201
612-235-1752

American Enka Co
See BASF Corp

American Excelsior Co
850 Ave H East
PO Box 5067
Arlington TX 76011
817-640-1555

American Honda Motor
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Gardena CA 90247
213-327-8280

American Playground Device Co
1801-31 S Jackson St
PO Drawer 2599
Anderson IN 46011
317-642-0288

American Stamp Co
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Wilton CA 95693
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American Standard Co
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Southington CT 06489
203-628-9643

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Delhi IA 52223
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Ames Lawn & Garden Tool Co
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Parkersburg WV 26102
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414-457-9435

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Phoenix AZ 85020
602-944-5591

Applied Biochemists Inc
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Mequon WI 53092
414-242-5870/800-558-5106

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1604 S West Ave
Waukesha WI 53186-7434
414-547-0211

Aquatic Irrigation Systems Inc
619 "E" E Gutierrez St
Santa Barbara CA 93103
805-965-5125

★Aquatrols Corp of America
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Pennsauken NJ 08110
609-665-1130/800-257-7797

Aquaturf
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Jacksonville FL 32241
904-268-6707

Arborchem Products Co
PO Box 1567
Fort Washington PA 19090
215-748-4455

Arbortech/A Scott Fetzer Co
3203 W Lincoln Way
Wooster OH 44691
216-264-4266

Architectural Precast Inc
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PO Box 23110
Columbus OH 43223
614-875-0963

Ariens Co
655 W Ryan St
Brillion WI 54110
414-756-2141

Arizona Power Equipment Co
12001 N Cave Creek Rd
Phoenix AZ 85020
602-944-5591

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Santa Ana CA 92704
714-557-5112

Asplundh Safety Equipment Co
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Montgomeryville PA 18936
215-628-0570

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Atwater OH 44201
216-947-2344

Auburn Consolidated Industries Inc
2100 S "J" St
Auburn NE 68305
402-274-4911

Badger Chipper Co
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517-894-4579

Barebo Inc
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Emmaus PA 18049
215-965-6018

Bartlett Mfg Co
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313-873-7300

★BASF Corp Fibers Div Geomatrix Systems
Enka NC 28728
704-667-7946

★ Advertiser. See Advertiser's Index

New CHIPCO® MOCAP® insecticide gives you the kind of grub control you need...control that's fast and effective.

CHIPCO MOCAP starts killing grubs as soon as you water it in. Other products take hours or days to work.

And all that time, grubs continue to feed, destroying your turf.

For best results, apply CHIPCO MOCAP before grubs start to feed—usually in August or early September. But if grubs get the jump on you, you can still take control quickly and effectively with fast-acting CHIPCO MOCAP.

And fast action is just part of the story. CHIPCO MOCAP gives effective control of a broad spectrum of grubs.

CHIPCO MOCAP KILLS OTHER TURF INSECTS, TOO.

CHIPCO MOCAP knocks out a broad range of surface insects, including chinchbug and sod webworm. And if nematodes or mole crickets are destroying your turf, you can destroy them, too, with CHIPCO MOCAP.

For the fastest, most effective control of grubs and other turf pests, include CHIPCO MOCAP in your turfgrass management program. CHIPCO MOCAP from Rhône-Poulenc Inc., makers of CHIPCO® 26019 and CHIPCO® Ronstar,® is a new addition to the CHIPCO line of fine products for turfgrass protection.

For more information write to Rhône-Poulenc, CHIPCO Department, P.O. Box 125, Monmouth Junction, NJ 08852

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CHIPCO® MOCAP®

Rubs out grubs.

CHIPCO, RONSTAR and MOCAP are registered trademarks of Rhône-Poulenc.

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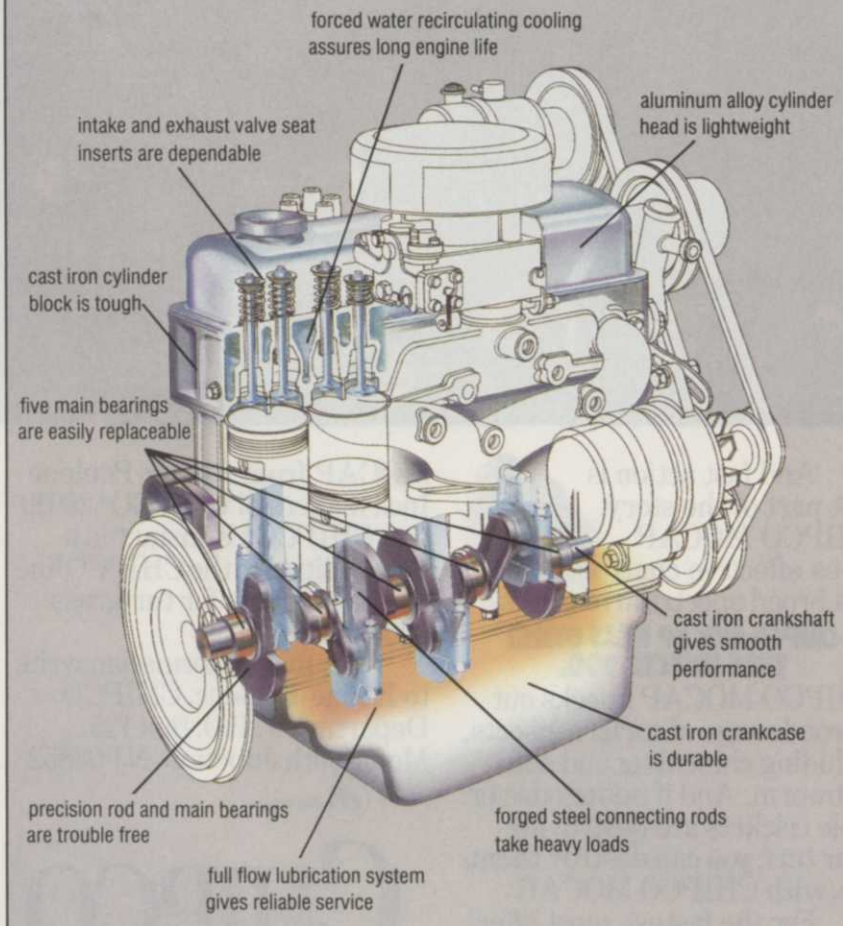
10 reasons why you should ask for a Continental R-Series engine

High performance, long life design — that's what the Continental R-Series liquid-cooled engines from Teledyne Total Power can offer you.

Take a look at the counterweighted spheroidal cast iron crankshaft with five main bearings and forged steel connecting rods... right down to the cast iron cylinder block and crankcase, you can depend on the quality to keep up with your equipment.

Ask for Continental R-Series engines from Teledyne Total Power, with over 5,000 distributors and service centers in over 90 countries ready to serve you. Send for your free "Reasons Why" brochure today: Teledyne Total Power, P.O. Box 181160, Memphis, TN 38181-1160, 901/365-3600, Telex: 462-1058 (ITT)



TELEDYNE TOTAL POWER

3409 Democrat Road • Memphis, TN 38118

Call toll-free: **1-800-932-2858**

R-11/14

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Equipment Companies

continued

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Shreveport LA 71139
318-687-0100

Beck Greenhouse Co
1510 Pumphrey Ave
PO Box 650
Auburn AL 36831-0650
205-821-4600

Best Way Inc
1315 S Eighth St
Clear Lake IA 50428
515-357-6155

B & G Equipment Co
Applebutter Ln
PO Box 130 Rte 611
Plumsteadville PA 18949
215-766-8811

Better Built Corp
845 Woburn St
Wilmington MA 01887
617-938-1002

Big John Tree Transplanter Mfg Inc
Hwy 110 East
PO Box 608
Heber Springs AR 72543
501-362-8161

BigToys
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Tacoma WA 98409
206-572-7611

Billy Goat Industries Inc
1803 S Jefferson
Lee's Summit MO 64063
816-524-9666

Bingham Equipment Co
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Buckeye AZ 85326
602-247-7638

BlueBird International Inc
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Englewood CO 80110
303-781-4458

John Blue Co
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Huntsville AL 35805
205-536-5581

Bock Products
1901 W Hively Ave
Elkhart IN 46515
219-294-5581

Bolens Corp
215 S Park St
Port Washington WI 53074

Bombardier Inc
Rue De La Montagne
Valcourt PQ Canada
J0E 2L0
514-532-2211

Bomford Center
R L Parson & Son Equipment Co
Box 28

BEFORE WE DEVELOPED THESE PROBLEM-SOLVING TURFGRASS MIXTURES, WE MARCHED THROUGH ACRES AND ACRES OF PROBLEMS.

Nobody knows the troubles we've seen.

Our Northrup King turf specialists and researchers have hoofed through salt problems, soil compaction, disease, starved turf, baked turf, cleated-to-shreds turf, and dormant winter turf—all depressing sights. But it was a road well worth our travels.

The result is a complete line of Medalist® turfgrass formulas that meet the demands of the professional turf manager.

If you've been staring down at a turf problem, look up your solution here. And if you think it's a turf problem we haven't seen, just let us know.

Our business is putting your problems behind us.

MEDALIST TURF PRODUCTS ™

MEDALIST TURF PRODUCT	MAJOR AREAS OF USE	SPECIAL FEATURES
Athletic Pro and Athletic Pro II	For athletic turf.	Well suited for new seeding or overseeding. Fast establishing, traffic tolerant, rapid recovery. Both provide good footing.
Boulevard Mix	Any area with high pH (roadsides, sidewalks, boulevards, alkaline soils, etc.).	Contains 'Fults' and Dawson red fescue for beautiful salt-tolerant turf. Performs at low to high fertility levels.
Landscape Pro Mix	School grounds, cemeteries, golf course roughs, home lawns.	Establishes fast. Adapts to broad range of conditions and management levels. Low to moderate fertility needs.
Overseeder II Mix	Fairways, tees, athletic fields.	Rapid germination and establishment. Withstands heavy traffic and resists diseases. Penetrates compacted soils.
Medalist North Mix	Fairways, tees, cart paths, wear areas.	Quality turf for high traffic areas. Clean mowing and disease resistant.
Premium Sod Blend	Commercial sod production.	Exceptional dark green color. Tolerates light shade. Superior disease resistance. Rapid sod producer.
Renovator Pro Mix	Problem solver for heavy traffic areas (athletic fields, golf tees, and fairways).	Penetrates compacted soils and combats *Poa annua.* Adaptable to most geographic regions.
Medalist Brand Overseeding Products	Winter overseeding of dormant bermudagrass.	Establishes rapidly and evenly. Tolerates traffic while providing a superior putting surface. Smooth spring transition.

Ask your Northrup King distributor about Medalist Turf Products to solve your turf problems. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.

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West Jefferson OH 43162
614-879-7601 879-7602

Bouldin & Lawson Inc
Rte 10 Box 208
McMinnville TN 37110
615-668-4090

★ Bowie Industries Inc
1004 E Wise St
PO Box 931
Bowie TX 76230
817-872-1106/800-433-0934

Briggs & Stratton Corp
12301 W Worth St
Milwaukee WI 53222
414-259-5333

★ Brillion Iron Works Inc
200 Park Ave
Brillion WI 54110
414-756-2121

Brinly-Hardy Co
340 E Main St
Louisville KY 40202
502-585-3351

★ Brouwer Turf Equipment Ltd
Woodbine Ave
Keswick ON Canada
L4P 3E9
416-476-4311
7320 Haggerty Rd
Canton MI 48187
313-459-3700

Roscoe Brown Corp
RR 1 Box 48
Lenox IA 50851
515-333-4551

Brown Mfg Corp
Route 3
Ozark AL 36360
205-795-6603

Broyhill Co
N Market Square
Dakota City NE 68731
402-987-3412

Buck Haven
Box 112 Kendricks Bldg
Northport WA 99157
604-367-9202

Buckner Irrigation
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Fresno CA 93711
209-275-0500

Buffalo Turbine Agricultural Equipment Co
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Gowanda NY 14070
716-532-2272

★ Bunton Co
4303 Poplar Level Rd
PO Box 33247
Louisville KY 40232
502-966-0550

Burkeen Mfg Co
11200 High Point Cove
Olive Branch MS 38654
601-895-4150

Bush Hog
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Selma AL 36701
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205-492-7847

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Columbus OH 43213
614-861-7775

Laurie Carlson & Assoc Ltd
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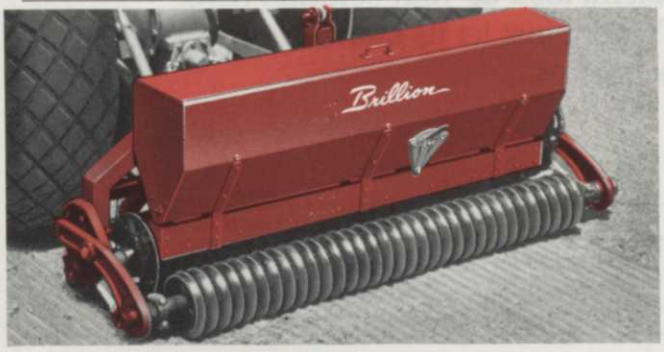
Waunakee WI 53597
608-849-4770/849-5166

J I Case Outdoor Power Equipment Div
700 State St
Racine WI 53404
414-636-6011

Caterpillar Lift Trucks
Towmotor Corp



Thick turf in one pass ...at less cost

BRILLION'S POPULAR LANDSCAPE SEEDER
eliminates costly hand labor and seeds big jobs in less time, at less cost. In one pass, you end up with sure, even, thick stands... the best looking seedings you've ever seen.

The Brillion presses out air pockets and firms the soil. It sows all grass seed mixtures... accurately, uniformly, and at the rate you select. And it sows the seed shallow, within the top 1/4" of soil, in a firmed, clod-free seedbed that cuts seed waste and promotes high germination and healthy growth.

In addition to Brillion's 5'4" Landscape Seeder, shown above, there's the 10' Turf-Maker Seeder designed for sod raisers and growers with larger areas to seed. Write or call Brillion for full-color literature on these two seeders today.

Brillion

Brillion Iron Works, Inc.
200 Park Avenue, Dept. 41-986
Brillion, WI 54110
Tel. 414/756-2121

SURE-STAND SEEDINGS EVERY TIME

Circle No. 108 on Reader Inquiry Card

INTRODUCING
the EJC
IMPERIAL WALK BEHIND AERATOR
(Patent Pending)

SPECIFICATIONS:
- Engine—5 HP, 4 Cycle Briggs and Stratton, 6 to 1 Gear Reduction
- Weight—450 lbs.
- Drive—Chain Driven and Belt
- Aerating Path—20"
- Width—Overall 30"
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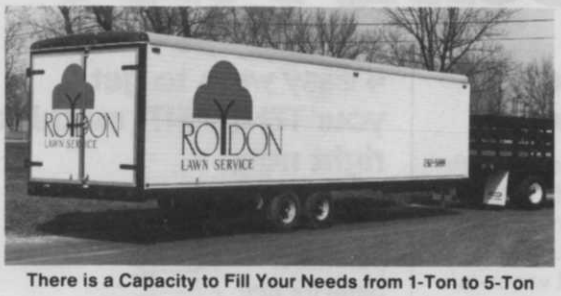

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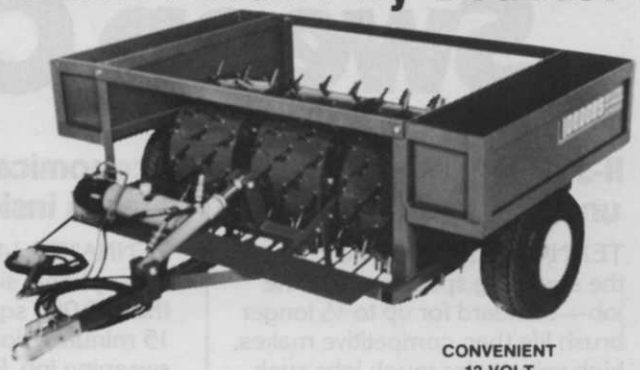

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- CLUB WASHER
- CHAIN
- DRAG BRUSH
- FAIRWAY MARKERS
- FLAGS
- HAZARD MARKERS
- HOLE CUTTERS
- KOOLER AID WATER CONTAINER
- LITTER CADDIES
- FLAG STICKS
- PRACTICE GREEN MARKERS
- RAKES
- SIGNS
- SPIKE KLEENERS
- TEE MARKERS
- TEE TOWELS
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Playworld Systems
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New Berlin PA 17837
717-966-1015; 800-233-8404

H K Porter Inc
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Somerville MA 02143
617-776-8200

W H Porter Inc Poligon/Cover-All Div
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4240 136th Ave
Holland MI 49423
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Rochester NY 14606
716-458-0800

Power Spray Technology Inc
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Sharon Hill PA 19079
215-461-6331

Precision Laboratories Inc
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PO Box 127
Northbrook IL 60065
312-498-0800

Precision Products Inc
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Springfield IL 62708
217-528-1311

Prentek Corp
See Multitek Inc

Presto Products Inc
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Howard Price Turf Equipment
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Box 246
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614-837-9096

Pro-Turf Mfg Inc
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Progressive Electronics Inc
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Mesa AZ 85202
602-966-2931/800-528-8224

Promark Products Inc
306 Ninth Ave
Industry CA 91746
818-261-9783

PSB Co
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Columbus OH 43216-1089
614-228-5781

Puror Corp
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Sarasota FL 33577
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Racal Airstream Inc
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Frederick MD 21701
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Rain Bird Sprinkler Mfg Corp
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Glendora CA 91740
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Panorama City CA 91402
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Sherwood OR 97140
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Sidefire Inc
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Bay City MI 48706
517-894-4570

Siebring Mfg Co
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George IA 51237
712-475-3317

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Port Washington WI 53074
414-377-5450

Sioux Steam Cleaner Corp
Sioux Plaza
Beresford SD 57004
605-763-2776

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Oxnard CA 93030
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Goleta CA 93117
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Santa Barbara CA 93101
805-963-9667

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804-245-4228

Son Shine Nursery
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Carthage MO 64836
417-358-8173/800-641-4552

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507-376-6230

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2850 Metro Dr
Minneapolis MN 55420
612-854-9426 MN/800-ELM-TREE

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Miami FL 33142
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806-747-9000

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Phoenix AZ 85013-3928
602-285-1660

★Supreme Corp
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PO Box 463
Goshen IN 46526-0463
219-642-4888

Swan Hose
PO Box 509
Worthington OH 43085
614-548-6511

Sweepster Jenkins Equipment Co
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Dexter MI 48130
313-426-3961

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206-481-2000

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Anaheim CA 92804
714-956-4040

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224 Thorndale Ave
Bensenville IL 60106
312-595-8500

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9733 Indianapolis Rd
PO Box 9247
Fort Wayne IN 46809
219-747-1631

★Tecumseh Products Co
900 N St
Grafton WI 53024
414-377-2700

★Teledyne Total Power
3409 Democrat Rd
Memphis TN 38118
901-365-3600

Telsco Industries (Weather-Matic)
3301 W Kingsley Rd
Garland TX 75041
214-278-6131

★Tennant Co
701 N Lilac Dr
PO Box 1452
Minneapolis MN 55440
612-540-1200/800-328-5727

Terracare Products Co
Hwy 22 & 33
PO Box 506
Pardeeville WI 53954
608-429-3402

Terrain Vehicles Inc
221 Mitchell Court
PO Box 418
Addison IL 60101
312-953-8747

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412 113th St
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Northport AL 35476
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612-887-8805

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PO Box 1191
Tacoma WA 98401
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Travelrain Sprinkler
239 N Robertson Blvd
Beverly Hills CA 90211
213-276-3213/276-8848

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4045-A Jonesboro Rd
Forest Park GA 30050
404-366-0957/800-331-1449

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27331 Tungsten Rd
Cleveland OH 44132
216-261-3400

Trojan Playground Equipment Mfg Co
11-2nd Ave NE
St Cloud MN 56301
612-251-3080

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305-785-6402

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3456 N Washington Ave
Minneapolis MN 55412
612-588-0741

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North Miami FL 33181
305-893-6449

Turf Vac Corp
2750 Gundry Ave
Signal Hill CA 90806
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404-482-7661

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304-744-5865

Universal-Gerwin Div
460 Main St
Saranac MI 48881
616-642-9413

Vandermolen Corp
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Livingston NJ 07039-1092
201-992-8506

Vermeer Mfg
One mile E on New Sharon Rd
Pella IA 50219
515-628-3141

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PO Box 6313
Chesapeake VA 23323
804-485-1600

V I T Products Co
15561 Product Lane D-4
Huntington Beach CA 92649
714-891-8338

Vrisimo Mfg Co
PO Box 699
Ceres CA 95307
209-537-5746

Walker Mfg Co
1839 E Harmony Rd
Ft Collins CO 80525
303-226-1514

Jim Walls Co
12820 Hillcrest Rd Ste 119
Dallas TX 75230
214-239-8577

Warren's Turf Nursery Inc
Chadbourne & Cordelia Rds
PO Box 459
Suisun City CA 94585
707-422-5100 CA/800-828-8873

Weather-Matic
See Telsco Industries

Weldco (WA) Inc
2328 Roosevelt Ave
PO Box 8
Enumclaw WA 98022
206-825-3581

★ Wells Cargo Inc
McNaughton
PO Box 728-473
Elkhart IN 46515
800-348-7553/219-264-9661

Western Cascade Inc
1150 N Red Gum St
Anaheim CA 92803
714-630-4640

Western Products
7777 N 73 St
Milwaukee WI 53223
414-354-2310

Western Wood Structures Inc
20675 SW 105 St
Tualatin OR 97062
503-692-6900

Westheffer Co
1235 N Third St
PO Box 363
Lawrence KS 66044
913-843-1633

Westinghouse Electric Corp Lamp Div
Bloomfield NJ 07003

Wheel Horse Products Inc
515 W Ireland Rd
PO Box 2649
South Bend IN 46680-9988
219-291-3112

Wheel Spray Corp
PO Box 97
Delafield WI 53018
414-646-8640

White Outdoor Products
PO Box 8875
Cleveland OH 44136
216-273-5272

WINCO Div Dyna Technology Inc
See Earth Energy Systems Inc

Winkler Hydraulics
9705 Enloe
South Elmonte CA 91733
818-443-6687

Wood/Chuck Chipper Corp
PO Drawer 400
Shelby NC 28150
704-482-4356

Woods Div Hesston Corp
Hwy 2 South
PO Box 1000
Oregon IL 61061
815-732-2141

Worksaver Inc
S State St Rd
Litchfield IL 62056
217-324-5973

Wylie Sprayers
PO Box 399
Hewitt TX 76643

Yamaha
6555 Katella Ave
Cypress CA 90630
714-761-7304

Yard Vac Prods Inc
3849 E Ventura
Fresno CA 93702
209-251-7125

Yazoo Mfg Co
3650 Bay St
PO Box 4449
Jackson MS 39216
601-366-6421

York Modern Corp
PO Box 488
Unadilla NY 13849
607-369-7111

Young Industries
1033 Wright Ave
Mountain View CA 94043
415-968-8486

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3. Chemicals

This section is broken down by chemical product with companies providing that chemical listed below. Products common name (in parentheses) and brand names are listed on the line following the company name.

Absorbefacient (Aquatic)

Aquashade Inc
(dyes) Aquashade

Adjuvant/Carrier

Arborchem Products Co
(Phytobland Oil) Clean Cut; (Phytobland oil, terpene) Clean Cut and Pine; Arborchem basil oil
Carmel Chemical Corp
(Gylcol) Carmel Carrier II
W A Cleary Corp
(non-ionic surfactant) All Wet; (fatty acid and esters, non-ionic) Super Wet
Drexel Chemical Co
(Petroleum Oils) Drexel Peptoil; (Alkylaryl polyethoxyethanol, n-butanol) Drexel Surf-Ac 820
Lesco Inc
(non-ionic surfactant) Lesco Spreader Sticker; (non-ionic wetting agent) Lesco West
PBI-Gordon Corp
(Petroleum oil-parafin base, surfactant blend) Adjumer
Precision Laboratories Inc
(Vegetable oil base) Pen-A-Trate
Regal Chemical Co
(Non-ionic wetting agent) DiAqua
Rohm & Haas Co
(Akyl aryl polyoxyethylne glycols) Triton
Stull Chemical Co
(Encapsulation & Suspension agent) Bivert
UAP Special Products Inc
Activator 90

Algaecide

Applied Biochemists Inc
(Mixed Copper Ethanolamine Complexes) Cutrine-Plus, Cutrine-Plus Granular, Aquatrine
Ciba Geigy Corp
(Simazine) Aquazine
Clean-Flo Laboratories Inc
(Buffered Alum) Lake Cleanser
Faesy & Besthoff Inc
Copper Sulphate
Great Lakes Biochemical Co
(liquid Chelated Copper) Algimycin PLL-C + (pelleted Chelated Copper Slow Release Algimycin PLL-C
Lesco Inc
(Elemental Copper) Lescocide plus Liquid and Granular
Pennwalt Corp
(Endothall) Hydrothol 191
Southern Mill Creek Products Co

Antitranspirant

Aquatrols Corp of America
(refined paraffin wax emulsion) Folicote
Bonide Chemical Co
(Acrylic Polymer Resins) Bonide Rabbit and Deer repellent
W A Cleary Chemical Corp
(acrylic polymers) Clearspray
Encap Products Co
Wilt-Pruf
PBI-Gordon Corp
(Polyethylenes/Polyterpines) Transfilm
Rockland Chemical Co
(Winter-Shield) Rockland
Wilt-Pruf Products Inc
Wilt-Pruf

Bacteriocide

Carmel Chemical Corp
(Quat) Carmel Disinfectant Solution
J J Mauget Co
(Streptomycin) Inject-A-Mycin 'S'
Merck & Co
(Streptomycin) AGRI-STREP

Colorant

Aquashade Inc
(Dye Colorant) Aquashade
Arborchem Products Co
(Oil Soluble blue) Basal Dye
W A Cleary Chemical Corp
(pigments) Greenzit, Super Greenzit, Super Greenzit C
Doggett Corp
Doggett Blue/Green Dye
Lesco Inc
(pigment) Lesco Green
Mallinckrodt Inc
Turf Colorant, Auragreen, Vitalon
Milliken Chemicals
Blazon
Precision Laboratories Inc
(blue dye) Signal; (yellow/green & hot pink dye) Tracer
Regal Chemical Co
Dy'on
Rockland Chemical Co
(Polymers) Green-Top

Compatibility Agent

Drexel Chemical Co
(Polyhydroxy Aliphatic compounds) Drexel Mix
Precision Laboratories Inc
(Alcohol Sulphates & Adjuvants) Compliment
Stull Chemical Co
(Encapsulation & Suspension agent) Bivert

Defoamer

Applied Biochemists Inc
(Silicon emulsion) Foamtrine
Arborchem Products Co
(Dimethysiloxane) Arborchem
Carmel Chemical Corp
(Silicone) Carmel Defoamer
W A Cleary Chemical Corp
(Dimethysiloxane) Cleary's
Great Lakes Biochemical Co
(Silicone Emulsion) Foam Out
Lesco Inc
(Silicone) Lesco Defoamer
Montco Products Corp
(Silicone) Zap!
Moyer Chemical Co
Anti-Foam, Foam Fighter
Precision Laboratories Inc
(Silicon Emulsion) Control, Knockdown
Regal Chemical Co
(Alkyl Polyoxyethylene) Foam-X

Drift Retardent

Arborchem Products Co
(Acrylic polymer, polysaccaride) Clean Way Drift Control; (Acrylic polymer) 38-F Drift Control
W A Cleary Chemical Corp
Drift-Proof
Chevron Chemical Co
Orthothrol
Nepera Inc
(Polyacrylates) Viterra 800
Precision Laboratories Inc
(vegetable oil base) Pen-A-Trate
Stull Chemical Co
(Encapsulation & Suspension agent) Bivert
UAP Special Products
Chemtrol

Fertilizer, Tree

Adco Works
Eeesy Grow
J & L Adikes Inc
(Urea-from) Gro-Well
Agro-Chem Inc
(Primary, Secondary & Micro Nutrients) Tes
The Andersons
(complex Iron) Lawn Pride Liquid Iron
C-I-L Inc
Sulfur Coated Urea
W A Cleary Chemical Corp
(Ureaformaldehyde concentrate) Fluf 18-0-0, Fluf 16-2-4
Creative Sales Inc
(Fe, Mn, Zn, N, P, K) Medicap
Ross Daniels Inc
Ross Fertilizer Stakes
Doggett Corp
(slow release) XL-Injecto Feed 32-7-7, XL-Injecto Feed 12-24-24; (NPK) XL-Spray-Fol 30-10-10

Estech Branded Fertilizers Inc Specialty Prods Div
(Isobutylidene Diurea) Woodace
Faesy & Besthoff Inc
Growth Products Ltd
(Slow release Methylene Diurea liq) Nitro-26 PLUS
Hawkeye Chemical Co
(Methylol ureas, methylene ureas, ureaformaldehyde, mono urea nitrogen and low salt index potassium) Formolene, Slo-Release
La Roche Industries Inc
N-P-K Vertagreen
Lebanon Chemical Corp
(16-4-8) Lebanon Pro
Lesco Inc
(sulfur coated nursery grade) Lesco 20-6-12, 14-26-6, 14-14-14 all with minors; (Hi Trace) Lesco Iron + N
J J Mauget Co
Stemix, Iron Zinc Stemix, Zinc Stemix
MCI Agsystems
(Triamino-triazine & Urea) MCI 55N, MCI 60N
Minntralia Mfg Inc
(Fish, Urea Nitrogen, Phosphoric Acid, Potassium Hydroxide, Norwegian Seaweed) Sunrane 8-8-8 Fish & Seaweed Fertilizer
Moyer & Son Inc
(16-3-3- 55% CRN) Arbor Flo; (9-27-5) RootFlo; (Iron Sulfur Chelate) MiroFlo Micronutrients
Moyer Chemical Co
Superblend 20-9-9, Container Spec 21-7-7
NOR-AM Chemical Co
(Ureaform) NitroForm-Slow Release Nitrogen
Plant Marvel Laboratories Inc
Plant Marvel
Rockland Chemical Co
(10% WIN-Nitroform, Iron, Copper, Manganese & Zinc) Rockland Soluble Tree Food 30-8-8
Sierra Chemical Co
Agriform
Southern Mill Creek Products Co

Fertilizer, Turf

J & L Adikes Inc
(Urea-form, Sulphur coated Urea) Gro-Well
Agro-Chem Inc
(Primary, Secondary & Micro Nutrients) Green Magic; (Soil Penetrant) Nutra-aid; (Soil Cleanser) Relief; (Primary, Secondary & Micro Nutrients) Strengthen & Renew
American Pelletizing Corp
(Lime, Gypsum) Reveille Pelletized; (Lime) Vita Power Pelletized
The Andersons
(N, P, K) Tee Time, Lustre Lawn, Liqua Line, custom mix
Center Plains Industries Inc
Ultra Turf, Zipp, Nitran
C-I-L Inc
Sulfur Coated Urea
W A Cleary Chemical Corp
(Ureaformaldehyde concentrate) Fluf 18-0-0, Fluf 16-2-4; (micronutrients) Trugreen
Doggett Corp
(NPK) XL-Turf Special 28-7-14; (slow release) XL-UF Turf Special 34-4-7
Estech Branded Fertilizers Inc Specialty Prods Div
(Isobutylidene Dirurea) IBDU, Par Ex Professional Products
Faesy & Besthoff Inc
Garfield Williamson Co
Lebanon-Swift
Jonathan Green & Sons
Spring Green-Up 20-4-4
Growth Products Ltd
(Slow release Methylene Diurea liq) Nitro-26 CRN
Hawkeye Chemical Co
(Methylol ureas, methylene ureas, ureaformaldehyde, mono urea nirogen and low salt index potassium) Fomolene, Slo-Release, Form-U-Sol
La Roche Industries Inc
(N-K-P) Vertagreen
Lebanon Chemical Corp
(N, P, K, S, Fe) Country Club, Greenskeeper, Green Gold, Turfmaster, Lebanon Pro
Lesco Inc
(blends with SCU, UF and/or all chemical) Lesco
MCI Agsystems
(Triamino-triazine & Urea) MCI 55, MCI 60N
Milwaukee Metropolitan Sewerage District
(6-2-0 Natural Organic) Milorganite
Minntralia Mfg Inc
(Fish, Urea Nitrogen, Phosphoric Acid, Potassium Hydroxide, Norwegian Seaweed) Sunrane 8-8-8 Fish & Seaweed Fertilizer
Moyer & Son Inc
TurFlo; (Iron Chelate) MicroFlo Micronutrients; (18-0-0 UF 30-0-2 UF) Fluf & Folmolene Super Blend 20-9-9
Moyer Chemical Co
Lawn & Golf 16-6-8, Superblend 20-9-9
NOR-AM Chemical Co
(Ureaform) Nitroform-Blue Chip and Powder
North Hampton County Seed Co
Lawn Fertilizer
PBI-Gordon Corp
(Liquid-Iron & Sulphur, Urea) Ferrimec (Precessed cow slurry) Bov-a-Mura
Plant Marvel Laboratories Inc
Plant Marvel Bent Special; Bermuda Special; Lawn Marvel;
Regal Chemical Co
(Nitrotorm) Regalite; (15-23-22) Regal Starter; (32-3-12) Regal Fwy fertilizer; (8-2-34) Regal Potash Plus; (22-6-6) Greens Nursery Special
Rhone-Poulenc Inc
(Sulfur, Copper, Iron Manganese, Zinc) Chipco Microgreen
Rockland Chemical Co
(IBDU, Nitroform, Micro) Rockland Twin Win; (Milorganite, IBDU, Iron) Rockland Mil-An-Chem II; (Milorganite, Urea) Rockland Mil-An-Chem I
O M Scott & Sons Co
(Methylene Urea/dry-applied) Proturf 31-3-10 Fairway; (Methylene Urea/liquid-applied) Proturf Milled 41-0-0; (SCU) Proturf 31-3-7 Turf
Sierra Chemical Co
Agriform, Osmolote
Southern Mill Creek Products Co
Sta-Green Plant Food Co
Sta-Green
Stanford Seed Co
(Balan) Old English
Sudbury Lawn & Garden Products
(Nitrogen, Phosphorus, Potash) Tailor-Made
Warren's Turf Nursery Inc
(SCU IBDU) Warren's Turf Professionals

Fungicide, Tree

American Pelletizing Corp
(Gypsum) Vita Power Pelletized
Bonide Chemical Co
(Captan) Bonide Captan 50W; (Benomyl + Bonide Folpet, phalton) Bonide Benomyl 50W; (Copper + Bonide liquid maneb) Bonide Liquid Copper
Ciba-Geigy Corp
(Metalaxyl) Subdue
Drexel Chemical Co
(Maneb) Drexel Manzi; (Dicofol) Drexel Dicofol E C
Elanco
(Fenarimol)Rubigan EC
Faesy & Besthoff Inc
Fermenta Plant Protection Co
(Chlorothalonil) Daconil 2787
Howe Inc
(ammoniated grade) 10-10-10
Lesco Inc
(Mancozeb) Lesco 4; (Maneb, Zinc) Lesco 4 Flowable with Zinc
Mallinckrodt Inc
(Zn, Mn, Thiophanate Methyl) Zyban
J J Mauget Co
(DEBC, Carbendazim) Fungisol; (Plantvax Oxycarboxin) Fungisol PV;
Merck & Co
(Thiabendazole) ARBOTECT
Mobay Chemical Corp
Bayleton 25 Turf & Ornament Fungicide
NOR-AM Chemical Co
(Cycloheximide) Acti-Dione TGF, Acti Dione RZ, Acti-Dione Thiram; (Propamocarb) Banol
Rohm & Haas Co
(Mancazeb) Dithane
Source Technology Biologicals Inc
(Copper Sulphate Pentahydrate) Phyton 27
Southern Mill Creek Products Co

Fungicide, Turf

J & L Adikes Inc
(Dyrene, Cadmium Chloride) Gro-Well
The Andersons
(Daconil) Tee Time, Luster Lawn, custom mix
Bonide Chemical Co
(Dyrene) Lawn Fungicide; (Chloeatholonial) Lawn & Turf Fungicide; (Thiram) Lawn disease control
Ciba-Geigy Corp
(Metalaxyl) Subdue
W A Cleary Chemical Corp
(Topsin-E) 3336-F; (Cadmium Chloride) Caddy; (PMAS) PMAS 10%

E I du Pont de Nemours & Co
(Manocozeb) Tersan LSR; (Benomyl) Tersan 1991
Elanco Products Co
(Fenarimol) Rubigan 50W
Fermenta Plant Protection Co
(Chlorothalonil) Daconil 2787
Garfield Williamson Co
Major Brands
Gustafson Inc
(Fungicide) Apron
Howe Inc
(Balan source Pre-emergence) 26-5-10; (Trimec source broadleaf) 20-10-10 Weed & Feed; (1/3 N from nitroform) 20-5-10 Turf Special; (quick green-up) 20-10-10 Lawn Food; (ammoniated grade) 10-10-10 Lawn & Garden; (formolene base N) 16-2-6 Liquid Lawn; (28% base N) 14-2-6 Liquid Lawn
Kincaid Enterprises Inc
(Chloroneb) Terraneb SP
Lebanon Chemical Corp
(Daconil) Greenview, Country Club, Green Gold
Lesco Inc
(Mancozeb) Lesco 4; (Thiram) Lesco Thiram; (PCNB) Lesco PCNB 10% G
Mallinckrodt Inc
(Mercuric Chloride, Mercurous Chloride) Calo-Clor, Calo-Gran; (Cadmium Succinate) Cadminate; (ZN, Mn EBCD, Thiophanate Methyl) Duosan; (Thiophanate Methyl) Fungo 50; (Cadmium Sebecate, Potassium, Chromate, Thiram) Kromad; (Ethazol) Koban 30, Koban 1.3G; (Thiram) Thiramad
Mobay Chemical Corp
Bayleton 25 Turf & Ornamental Fungicide; Dyrene 4 Turf Fungicide
Nor-Am Chemical Co
(Cycloheximide) Acti-Dione TGF, Thiram, RZ; (Propamocarb) Banol
PBI Gordon Corp
(Chloroneb) Teremec SP (Fore) Formec 80
Rhone-Poulenc Inc
(Iprodine) Chipco 26019; (Aluminum Tris) Aliette
Rockland Chemical Co
(8.6% Dyrene) Rockland Dyrene; (Benomyl; (Daconil) Rockland Lawn Fungicide 2787
Rohm & Haas Co
(Mancozeb) Fore
O M Scott & Sons Co
(Thiophanate-Methyl, Iprodione) Proturf; (PCNB) Proturf FFII
Southern Mill Creek Products Co

Growth Regulator

Aquashade Inc
(Dye Colorant) Aquashade
Arborchem Products Co
(Paclobutrazol) Clipper; (Ethyle ester of NAA) Sprout Gard
J & L Adikes
Embark
Cal-Fiber Co
(Cellulose) Mulch
W A Cleary Chemical Corp
(6-Benzyladenine) Pro-Shear
Drexel Chemical Co
(Maleic Hydrazide) Drexel Retard
Elanco
(Flurprimidol) Cutless; (Ancymidol) ARest
Maag Inc
Atrinal
3M/Agricultural Products
(Mefluidide) Embark
Merck & Co
(Gibberellic Acid) GIBREL
Monsanto Co
Limit
PBI Gordon Corp
(Atrinal) Attrimec; (Mefluidide) Embark
Pennwalt Corp
Perlux Inc
(Liquid Growth Retardant) Perlux
Regal Chemical Co
Regal Crown
UAP Special Products
Respond

Herbicides, Aquatic

Applied Biochemists Inc
(Diquat Dibromide) Weedtrine-D; (2,4-D ester) Weedtrine II
Aquashade Inc
(Dye Colorant) Aquashade
Chevron Chemical Co
Ortho Diquat Herbicide H/A
Clean-Flo Laboratories Inc
(Buffered Alum) Lake Cleanser
Elanco
(Fluridon) Sonar
Faesy & Besthoff Inc
Monsanto Co
Rodeo
Pennwalt Corp
(Endothol) Aquathol K/Aquathol Granular Hydrothol 191/Hydrothol Granular
Riverdale Chemical Co
(2,4-D Granuals) Riverdale; (AM-4D) Riverdale Weedestroy
Southern Mill Creek Products Co
Union Carbide Ag Prod Co

Herbicides, Nonselective

J & L Adikes Inc
(Prometon) Gro-Well
American Cyanamid
(Imidazoline) Arsenal
Arborchem Products Co
(Bromacil) Clearway
Bonide Chemical Co
(Ammonium Sulphamate) Bonide Ammate XNI (Sodium Arsenite) Bonide Sodium Arsenite
Carmel Chemical Corp
(Bromacil) Carmel Vegetation Killer
Chevron Chemical Co
Ortho Paraquat Plus
Drexel Chemical Co
(Atrazine) Drexel Atrazine 4L & Atrazine 5L; (Diuron) Drexel Diuron; (DSMA) Drexel DSMA Liquid & DSMA Slurry; (Simazine) Drexel Simazine 4L; (MSMA) Drexel MSMA 4 Plus, MSMA 6 Plus & MSMA 6.6
Elanco Products Co
(Tebuthiuion & Trifluralin) Spike Treflan 6G
Faesy & Besthoff Inc
Garfield Williamson
Major Brands
La Roche Industries Inc
(Ammonium Sulfamate) Vertagreen
Lesco Inc
(Ureabor) Lescobor
Monsanto Co
(Glyphosate) Roundup
Occidental Chemical Co
Monobor Chlorate, Ureabor
PBI Gordon Corp
(Dichlobenil) Nordsac 10-G, Barrier 50-W; (Prometon 2,4-D, Vegemec
Riverdale Chemical Co
(Granular Vegetation Killer) Riverdale; (Granular Herbicide) Riverdale; (Herbicide) Riverdale Killsall
Rockland Chemical Co
(Pramitol + 2, 4-D) Rockland
Southern Mill Creek Products Co

Herbicides, Postemergence Selective

J & L Adikes Inc
(Trimec, AMA, 2,4-D, DSMA Gro-Well
The Andersons
(2, 4-D, MCPP) Tee Time, Lustre Lawn, custom mix
Aquashade Inc
(Dye Colorant) Aquashade
Arborchem Products Co
(Triclopyr, Picloram) Tordon 1 Plus 2 Mixture; (Triclopyr) Garlon 4
Bonide Chemical Co
(Banvel + 2,4-D) Bonide Lawn Weed Killer-Liquid or granular, Bonide Chickweed & Clover Killer, Bonide Crabgrass & Broadleaf Weed Killer
W A Cleary Chemical Corp
(2,4-D, + dichlorprop) Weedone DPC (DSMA) Methar 30; (Mecoprop) Cleary's MCPP; (Mecoprop/2, 4-D) Cleary's MCPP/2, 4-D
Dow Chemical Co
(Triclopyr + 2,4-D, ester formulation) Turflon D; (Triclopyr + 2, 4-D, amine) Turflon II Amine
Drexel Chemical Co
(MSMA) Drexel Ansar 529, MSMA 6 Plus, MSMA 6.6, MSMA 4 Plus; (Atrazine) Drexel Atrazine 4L & 5L; (DSMA) Drexel DSMA Liquid & Slurry; (Cacodylic Acid) Drexel KACK; (Cacodylic Acid + MSMA) Drexel KACK + MSMA; (Simazine) Drexel Simazine 4L
Elanco Products Co
(Teuthiuron) Spike
Faesy & Besthoff Inc
Fermenta Plant Protection Co
(MCPP Amine & 2,4-D Amine) 2 Plus 2-MCPP+2,4-D; (MSMA) Daconate 6; (Dalapon) Dalapon 85
Garfield Williamson
Major Brands
La Roche Industries
(2, 4-D, Dicamba) Vertagreen; (Dacthal) Vertagreen 5%

Lebanon Chemical Corp
(2,4-D + MCPP) Lebanon, Green Gold; (DSMA) Greenview
Lesco Inc
(2,4-D & 2,4-DP)Lesco Granular Herbicide, Lesco Weedone DPC; (MCPP+2,4-D, MCPP+2,4-D-dainber, decainba+2,4-D) Lescopar, Lesco 3 Way, 8:1
Mallinckrodt Inc
(Dicamba, 2,4-D, MCRP) Trexsan
Mobay Chemical Corp
Sencor Turf Herbicide
Monsanto Co
(Glyphosate) Roundup
NOR-AM Chemical Co
(Ethofumesate) Prograss
PBI Gordon Corp
(Esters of 2,4-D & 2,4-DP + Dicamba) Super Trimec; (2,4-D, MCPP + Dicamba) Trimec; (Dichlobenil) Dyclome 4-G, Norsac 4-G
Pennwalt Corp
(Endothall) Endothal Turf
Rhone-Poulenc Inc
(Bromoxynil) Chipco Buctril; (2,4-D, MCCP) Chipco Turf Kleen
Riverdale Chemical Co
(AM-4D) Riverdale Weedestroy; (Herbicide) Weedestroy Triamiane; (MCPP) Weedestroy; (MCPP+D) Weedestroy; (Herbicide) Casoron; (Herbicide) Weedestroy Tri-Ester; (D+DP) Riverdale Turf; (Herbicide) Triamiane Lawn Weed Killer
Rockland Chemical Co
(2LB, 2, 4-D + 2, 4-DP) Rockland Lawn & W K DDP; (MCPP-2, 4-DP, 2, 4-D) Rockland Tri-Amine LWK; (MCPP-2, 4-D, Banuel D) Rockland Three Way LWK
Rohm & Haas Co
(Pronamide) Kerb; (Oxyfluorfen) Goal
O M Scott & Sons Co
(2,4-D, MCPP, Dicamba) Proturf
Sta-Green Plant Food Co
(2, 4-D, Dicamba, MCPP) fertilizer + Trimec; (Atrazine) fertilizer + Atrazine
Sudbury Lawn & Garden Products
(2, 4-D) Killer Kane w/Kartridges
UAP Special Products
(2,4-D, MCPP dicamba) Mec Amine-D, Mec Amine Plus; (2,4-D, dicamba) Four Power Plus

Herbicides, Preemergence

J & L Adikes Inc
(Balan, Tupersan, Betasan) Gro-Well
The Andersons
(Balan, Dacthol, Betasan, Siduron) Tee Time, Lustre Lawn; (Dursban, Treflan) Team, custom mix
Aquashade Inc
(Dye Colorant) Aquashade
Bonide Chemical Co
(75W Dacthal) Bonide Dacthal; (Eptam) Bonide Eptam; (5% G Dacthal) Bonide Dacthal
Ciba-Geigy Corp
(Metalachlor) Pennant
Drexel Chemical Co
(Simazine) Drexel Simazine 4L
Elanco Products Co
(Trifluralin & Benefin) Team; (Oryzalin & Benefin) XL; (Benefin) Balan; (Oryzalin) Surflan; (Trifluralin) Treflan
Faesy & Besthoff Inc
Fermenta Plant Protection Co
(DCPA) Dacthal
Garfield Williamson Co
Major Brands
La Roche Industries Inc
(Balan) Vertagreen 2.5%; (Betasan) Vertagreen 7%
Lebanon Chemical Corp
(Betasan, Balan, Dacthal, Team, Ronstar) Greenskeeper, Lebanon; (Treflan, Tupersan) Green Gold, Greenview
Lesco Inc
(Bensulide) Lescosan; (Pendimethelin, DCPA) Lesco Dacthal 5G, Lesco Pre-M; (Benefin, Napropamide) Lesco Benefin, Lesco Devrinol
Mallinckrodt Inc
(Bensulide) Presan
NOR-AM Chemical Co
(Ethofumesate) Prograss
PBI Gordon Corp
(Dichlobenil) Norosac 4-G, Dyclomec 4-G; (Bensulyde) Bensumec 4LD
Regal Chemical Co
(Oxadiazon + Balan) Regal Star; (Oxadiazon) Regal Ronstar Plus
Rhone-Poulenc Inc
(Oxadiazon) Chipco Ronstar
Riverdale Chemical Co
Rohm & Haas Co
(Pronamide) Kerb; (Oxyfluorfen) Goal
O M Scott & Sons Co
(Pendamethalin) Proturf
Sta-Green Plant Food Co
(Ronstar) fertilizer + 1.0% Ronstar; (Surflan, Balan) fertilizer + XL; (Betasan) fertilizer + 3.6% Betasan
Stauffer Chemical Co
(Bensulide) Betasan
UAP Special Products
(DCPA) Dacthal WDG; (Benefin) Balan 2.5G; (Bensulide) Betasan

Insecticides, Tree

J & L Adikes Inc
(Malathion, Methoxychlor, Diazinon, Sevin) Gro-Well
Bonide Chemical Co
(Methoxychlor 25%) Bonide Metoxychlor 25E; (Cygon) Bonide Cygon 2E; (Metasystox R) Bonide Metasystox R 2E; (Carbaryl) Bonide Sevin 2F; (Malathion 50%) Bonide Malathion 50E; (Diazinon 25%) Bonide Diazinon 25E
Chevron Chemical Co
(Acephate Dibrom 8 Emulsive) Orthene; (Lindane) Naled Isotox Lindane Spray 200
Ciba-Geigy Corp
(Diazinon) DZN
W A Cleary Chemical Corp
(Carbaryl) Cleary's Sevin SL
Creative Sales Inc
(Acephate/Orthene) Acecap
Ross Daniels Inc
(Di-Syston) Ross
Dow Chemical Co
(Chlorpyrifos) Dursban 50W
Drexel Chemical Co
(Carbaryl) Carbaryl 4L & 2L; (Diazinon) D-264-4E; Methoxychlor) Drexel Methoxychlor 4L; (Endosulfan) Drexel Endosulfan
Faesy & Besthoff Inc
Garfield Williamson Co
Major Brands
Kincaid Enterprises Inc
(Methoxychlor) Marlate 50
Lesco Inc
(Diazinon) Lesco Diazinon 500; (Chlorpyrifas) Lesco Dursban 2E & 4E
Mallinckrodt Inc
Bendiocarb, Dycarb, (Diazinon & Methoxyclor) Dymet; (Bendiocarb) Dymet
J J Mauget Co
(Demeton Methyl) Inject-A-Cide; (Dicrotophos) Inject-A-Cide "B"
Mobay Chemical Corp
Metasystox-R 2 Ornatmental Insecticide
Baygon 70 Wettable Powder Insecticide
NOR-AM Chemical Co
(Bendiocarb) Turcam
PBI-Gordon Corp
(Fenitrothion) Pestroy
Prentiss Drug & Chemical Co
(Diazinon, Malathion, Methoxychlor) Prentox
Rockland Chemical Co
(Organic spray) Rockland Rotenone Pyrethrum Spray; (Malthaion, Methoxychlor, Kelthane) Rockland Shade Tree Insect Spray; (2E Methoxychlor) Rockland Methoxychlor 2-E
Southern Mill Creek Products Co
Stauffer Chemical Co
Imidan
Union Carbide Ag Prod Co
Sevin
Zoecon Corp
(Fluvalinate) Mavrik Aquaflow

Insecticides, Turf

J & L Adikes Inc
(Oftanol, Diazinon, Dursban, Sevin) Gro-Well
American Cyanamid Co
(Dimethoate) Cygon
The Andersons
(Dursban, Diazinon) Tee Time, custom mix; (Oftanol) Lustre Lawn
Bonide Chemical Co
(Dursban) Bonide Dursban 2E; (Diazinon 25%) Bonide Diazinon 25E; (Carbaryl) Bonide Seven 10% & 5%
Chevron Chemical Co
(Acephate) Orthene
Ciba-Geigy Corp
(Diazinon) DZN
W A Cleary Chemical Corp
(Chlorpyrifos) Dursban 2E; (Diazinon) Diazinon 5% Granules, Diazinon AG-500
Dow Chemical Co
(Chlorpyrifos) Dursban
Drexel Chemical Co
(Carbaryl) Drexel Carbaryl 4L & 2L; (Diazinon) Drexel D264-4E
Faesy & Besthoff Inc
Kincaid Enterprises Inc
(Methoxychlor) Marlate 50
La Roche Industries Inc
(Sevin) Vertagreen Sevin 5%; (Diazinon) Vertagreen 12.5%, 25%; (Macathion) Vertagreen 55%; (Diazinon) Vertagreen 5%; (Chlorpyrifos) Vertagreen 1.14% Dursban

Lesco Inc
(Trichlorfon) Lesco Dylox 5G; (Diazinon) Lesco Diazinon 500, 5G & 14G; (Chlorpyrifes) Lesco; (Isofenfos) Lesco Oftanel 1.5G
Lebanon Chemical Corp
(Dursban, Oftanol) Greenview, Lebanon Pro Green Gold, Country Club, Greenskeeper
Mallinckrodt Inc
Diazinon & Methoxyclor, Dymet
Mobay Chemical Corp
Oftanol 5% Granular, Oftanol 2, Dylox 80
NOR-AM Chemical Co
(Dioxathion) Deltic; (Bendiocarb) Turcam; (Trichlorfon) Proxol
PBI Gordon Corp
(Carbaryl) Carbanec; (Fenoxicarb on vegetable oil-coated expanded corn grit) Logic Fire Ant Bait
Prentiss Drug & Chemical Co
(Diazinon, Chlorpyrifos, Propoxur) Prentox
Rhone-Poulenc Inc
(Ethoprop) Chipco Mocap
Rockland Chemical Co
(2.32% Dursban) Rockland Super Dursban; (Trichlorofon) Rockland White Grub Control; (Diazinon, Kelthane) Rockland 5% Diazinon
O M Scott & Sons
(Isofenphos) ProTurf Insecticide 4; (Diazinon) Proturf Insecticide One
Southern Mill Creek Products Co
Sta-Green Plant Food Co
(Oftanol) fertilizer + 1.5% Oftanol; (Dursban) fertilizer + 0.67% Dursban; (Oftanol) 1.5% Oftanol on Cob
Stanford Seed Co
(Oftanol) Old English
Stauffer Chemical Co
Aspon
UAP Special Products
(Bendiocarb) Turcam 2.5G
Union Carbide Ag Prod Co
(Carbaryl) Sevin
Zoecon Corp
(Fluvalinate) Mavrik Aquaflow

Miticides

J & L Adikes Inc
(Kelthane) Gro-Well
Bonide Chemical Co
(Kelthane 18.5) Bonide Kelthane
Mobay Chemical Corp
Morestan 25%
Rockland Chemical Co
Rohm & Hass Co
(Dicofol) Kelthane
Zoecon Corp
(Dienochlor) Pentac Aquaflow

Mulches And Erosion Control

American Excelsior
(Excelsior Blanket) Curlex
Cal-Fiber Co
Cellin Mfg Inc
Cellin, Cellin-K, Cellin Seal
Conwed Corp
Hydro Mulch
Finn Corp
(tackifier/gum) Hydro-Stik; (mulch fiber additive) Fiber Plus
Grass Fiber Inc
(Processed Fiber) Grass Mulch
Grass Growers Inc
Terra Tack I, III, AR, MP
Hoechst Fibers Ind
National Bark Sales
(sized forest bark) High Sierra, Ponderosa; (shredded red cedar) Montaho
Nepera Inc
(Potassium Propenoate-Propenamide Copolymer) Viterra Gelscape
Ozark Landscaping Products
(oak, pine, cedar)
Phillips Fibers Corp
Weed Conrol Mat
Reclamare Co
(Hydrocolloids) J-tac; (Plantago ovata) R-2400; (Poly vinyl acrylic)
Soil Seal Corp
(Coploymer Basel) Soil Seal Concentrate
Thermoguard
Turfiber-Cellin
Warren's Turf Nursery Inc
Warren's Terrabond Polyester Geotextile Fabrics
Weyerhauser
Weyerhauser Silva Fiber

Nematocides

Bonide Chemical Co
(Vapam) Bonide Soil Fumigant
La Roche Industries Inc
(Vapam) Vertagreen
Mobay Chemical Corp
Nemacur 3 & 10%
Rhone-Poulenc Inc
(Ethoprop) Chipco Mocap
Stauffer Chemical Co
Vapam
Lesco Inc
(petroleum based) Lesco 4-Way Lubricant

Repellents, Animal

Bonide Chemical Co
(Thiram + acrylic polymer resins) Bonide Rabbit & Deer Repellent
W A Cleary Chemical Corp
(Thiram) Spotrete F, Spotrete 75% WP
Faesy & Besthoff Inc
Rockland Chemical Co
Deer-Guard
Sudbury Lawn & Garden Products
(Oil of Lemongrass & Allylisothiocyanate) Chaperone Dog & Cat Repellent, Repel-O-Rope; (Tetramethylthiuramdisulfide) Chaperone Rabbit & Deer Repellent; (Naphthalene) Chaperone Squirrel & Bat Repellent

Root Killer

Faesy & Besthoff Inc

Soil Amendments

Bonide Chemical Co
(Sulfur 95%) Bonide Sulfur
Finn Corp
(Starch acrylate water absorbant) Hydro Gel
Lesco Inc
(ferment & polymers) Lescozyme
Nepera Inc
(Potassium Propenoate-Propenamide Copolymers) Viterra Glescape
PBI Gordon Corp
(Processed cow slurry) Bov-A-Mura
Sta-Green Plant Food Co
Pro-Start, Pro-Start Plus

Soil Conditioner

Aquatrols Corp of America
(polyacrylamide water absorbant polymer) Super Sorb
Cal-Fiber Co
(Cellulose) Mulch
W A Cleary Chemical Corp
(Dolomitic Limestone) Limestone F; (Elemental sulfur) Sulphur F
Faesy & Besthoff Inc
Four Star Agricultural Services Inc
(Ammonium Laureth Sulfate) Pene-Turf
Grass Fiber Inc
Garden Mulch
International Reforestation Suppliers Inc
Lesco Inc
(ferment & polymers) Lescozyme
Michigan Peat Co
(Peat Moss) Baccto Michigan Peat, Baccto Horticultural Sphagnum, Baccto Top Soil
National Bark Sales
(Composted Bark) Top-N-Turf
Nepera Inc
(Potassium Propenoate-Propenamide Copolymer) Viterra Gelscape
Oil-Dri Corp of America
(Montmorillonite) Terra Green
Ozark Landscaping Products
(oak, pine, cedar)
Sudbury Lawn & Garden Products
(Liquified Seaweed) Sea Power Seaweed

Soil Fumigants

Bonide Chemical Co
(Vapam) Bonide Soil Fumigant
Faesy & Besthoff Inc
Hendrix & Dail Inc
(Methyl Bromide/Chloropicrin) MBC Soil Fumigant, MBC Concentrate, MBC-33; (Chloropicrin) HD-Pic Fumigant
Stauffer Chemical Co
Vapam
Sudbury Lawn & Garden Products
(1-1-1 Trichloroethane) Fire Ant Killer

Sticker Extender

J & L Adikes Inc
NuFilm 17
Bonide Chemical Co
Bonide Spreader Sticker
Chevron Chemical Co
Chevron Spray Sticker

W A Cleary Chemical Corp
(acrylic polymers) Clearspray
Encap Products Co
Spray-Stay
Kalo Agricultural Chemicals
BioFilm
Lesco Inc
(non-ionic surfactant/sticker) Lesco Sticker-Spreader
Precision Laboratories Inc
(Non-Ionic Surfactant, vegetable oil base) Pen-A-Trate
Rohm & Haas Co
(Modified phthalie glycerol alkyd resin) Triton
Stull Chemical Co
(Encapsulation & Suspension agent) Bivert
UAP Special Products
Bond
Wilt-Pruf Products Inc
Spray-Stay

Tree Dressings

J & L Adikes Inc
Gro-Well
Arborchem Products Co
(Ethyl ester of NAA) Sprout Gard
Bartlett Mfg Co
Bonide Chemical Co
Bonide Tree Wound Paint, Bonide Pruning Bomb
Coopers Creek Chemical Corp
C-4
Lesco Inc
Lesco Pruning Paint
Rockland Chemical Co

Wetting Agents

Aquatrols Corp of America
(non-ionic polyoxyethelene esters and ether alcohols) Aqua-Gro "L", "S"
Arborchem Products Co
(blended non-ionic surfactants) Arborchem
W A Cleary Chemical Corp
(non-ionic surfactant) All Wet; (fatty acid and esters, non-ionic) Super Wet, Super Wet 15G
Drexel Chemical Co
Drexel Wetz
E I du Pont de Nemours & Co
Surfactant WK
Finn Corp
Hydro-Gel
Lesco Inc
(non-ionic wetting agent poylmer) Lesco Wet
Mallinckrodt Inc
Aquagro
Montco Products Corp
(Non-ionic Surfactants) Surf-Side
PBI-Gordon Corp
(Oxyetheylene) Aqua-Zorb
Precision Laboratories Inc
(Non-Ionic Surfactant, vegetable oil base) Pen-A-Trate
Regal Chemical Co
D'Aqua
Rohm & Haas Co
(Alkyl aryl polyoxyethylene glycols) Triton

4. Chemical Companies

J & L Adikes Inc
182-12 93rd Ave
Jamaica NY 11423
718-739-4400

★ Agro-Chem Inc
11150 W Addison
Franklin Park IL 60130
312-455-6900

American Cyanamid Co
Agricultural Div
One Cyanamid Plaza
Wayne NJ 07470

American Excelsior Co
850 Ave H East
PO Box 5067
Arlington TX 76011
817-640-1555

American Pelletizing Corp
PO Box 3628
Des Moines IA 50322
515-278-5900

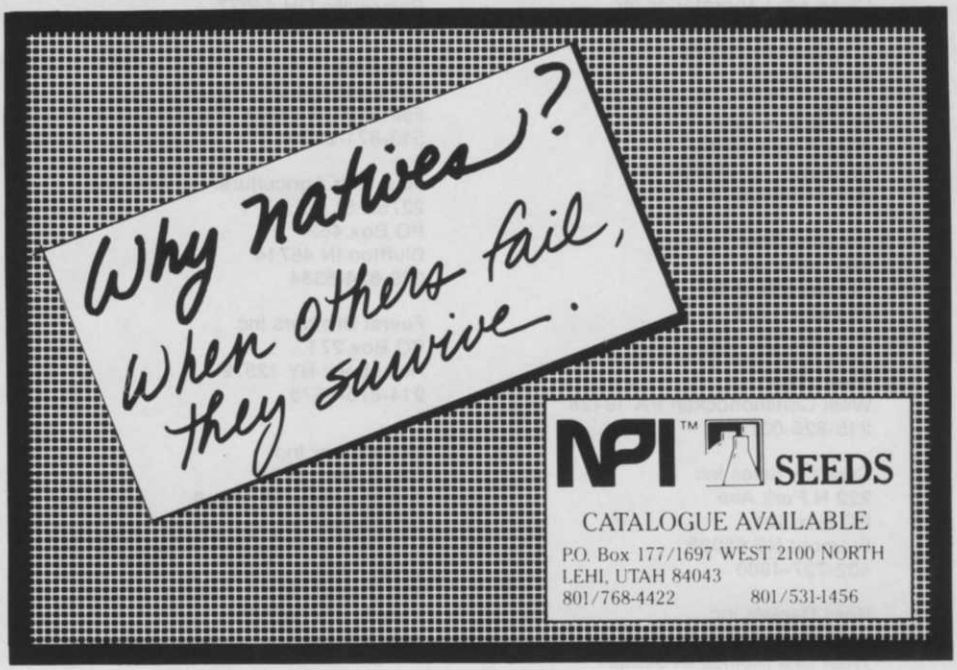
The Andersons
1200 Dussel Dr
Maumee OH 43537
419-893-5050

Applied Biochemists Inc
5300 W County Line Rd
Mequon WI 53092
414-242-5870/800-558-5106

Aquashade Inc
PO Box 198
Eldred NY 12732
914-557-8077

★ Aquatrols Corp of America
1432 Union Ave
Pennsauken NJ 08110
609-665-1130/800-257-7797

Arborchem Products Co
PO Box 1567
Fort Washington PA 19090
215-748-4455



Circle No. 146 on Reader Inquiry Card

Bonide Chemical Co
2 Wurz Ave
Yorkville NY 13495
315-736-8231

Cal-Fiber Co
611-625 S Anderson St
Los Angeles CA 90023
213-268-8381

Carmel Chemical Corp
17303 US 31 N
Westfield IN 46074
317-896-2531

★ Cellin Mfg Inc
9610 Gunston Cove Rd
Lorton VA 22079
703-690-1195

Center Plains Industries Inc
10800 Canyon Dr
Amarillo TX 79114
806-622-2000

★ Chevron Chemical Co
575 Market St
San Francisco CA 94105
415-894-2378

★ Ciba-Geigy Corp Ag Div
401 Swing Rd
Box 18300
Greensboro NC 27419
919-292-7100

C-I-L Inc
171 Queens Ave
PO Box 5201
London ON N6A 4L6
Canada
519-672-9220

Clean-Flo Laboratories Inc
4342 Shady Oak Rd
Hopkins MN 55343
612-935-2137

W A Cleary Corp
1049 Somerset St
Somerset NJ 08873
201-247-8000

Conwed Corp
444 Cedar St
St Paul MN 55101
612-221-1100

Coopers Creek Chemical Corp
River Road
West Conshohocken PA 19428
215-828-0375

Creative Sales Inc
222 N Park Ave
PO Box 501
Fremont NE 68025
402-727-4800

Ross Daniels Inc
1720 Fuller Rd
West Des Moines IA 50265
515-225-6471

Doggett Corp
Cherry St
Lebanon NJ 08833
201-236-6335

★ Dow Chemical Co/Ag Products
9008 Bldg
PO Box 1706
Midland MI 48640
517-636-1000

Drexel Chemical Co
2487 Pennsylvania St
Memphis TN 38109
901-774-4370

★ E I du Pont de Nemours & Co
BMP Lancaster Pike & Center Rd
Wilmington DE 19898
302-774-1000

★ Elanco Products Co
Lilly Corporate Center
Indianapolis IN 46285
317-261-5589

Encap Prods Co
PO Box 278
Mt Prospect IL 60056
312-593-6464

★ Estech Branden Fertilizers Inc
Specialty Products Div
PO Box 512
Winter Haven FL 33882-0512
813-294-2567

Faesy & Besthoff Inc
143 River Road
Edgewater NJ 07020
201-945-6200

Fermenta Plant Protection Co
7528 Auburn Rd
PO Box 348
Painesville OH 44077

★ Finn Corp
9281 LeSaint Dr
Fairfield OH 45014
513-871-2529

Four Star Agricultural Services Inc
2275N St Rd 1
PO Box 463
Bluffton IN 46714
219-824-5384

Fuerst Brothers Inc
PO Box 271
Rhinebeck NY 12572
914-876-3575

Grass Fiber Inc
520 E Second St
Junction City OR 97448
503-998-6812

Grass Growers Inc
424 Cottage Pl
Plainfield NJ 07060
201-755-0923

Great Lakes Biochemical Co
6120 W Douglas Ave
Milwaukee WI 53218
414-464-1200

Growth Products Ltd
PO Box 1259
White Plains NY 10602
914-428-1316

Gustafson Inc
PO Box 660065
Dallas TX 75266
214-985-8877

Hawkeye Chemical Co
Box 899
Clinton IA 52732
319-243-5800

Hendrix & Dail Inc
803 Industrial Blvd
Greenville NC 27835
919-758-4263

Hoechst Fibers Ind
PO Box 5887
Spartanburg SC 29304
800-845-7597

Howe Inc
4821 Xerxes Ave N
Minneapolis MN 55430
612-535-1030

Kincaid Enterpises Inc
Box 671 Plant Rd
Nitro West Virginia 25143-0671
304-755-3377

La Roche Industries Inc
1100 Johnson Ferry Rd NE
Atlanta GA 30342
404-851-0377

Lebanon Chemical Corp
1600 E Cumberland St
Lebanon PA 17042
717-273-1685

★ Lesco Inc
20005 Lake Rd
Rocky River OH 44116
216-333-9250

Maag Inc
PO Box 6430
Kings Hwy
Vera Beach FL 32961-6430
305-567-7506

J J Mauget Co
2838 N Naomi St
PO Box 3422
Burbank CA 91504
213-849-2309 CA/800-423-2699

MCI AgSystems Div
Melamine Chemicals Inc
811 Railroad Ave
Donaldsonville LA 70346
504-473-3121

★ Merck & Co
PO Box 2000
Rahway NJ 07065-0912
201-750-8463

Michigan Peat Co
PO Box 66388

★ Advertiser. See Advertiser's Index

Houston TX 77266
800-231-6211/713-522-0711

★ Milliken Chemical
Campton Rd
PO Box 817
Inman SC 29349
803-472-9041/800-845-8502

Milwaukee Metropolitan Sewerage District
735 N Water St
Milwaukee WI 53202
414-225-2222

3M/Agricultural Products
3M Center/Bldg 223-1N-05
St Paul MN 55144-1000
612-733-3150

Minntrália Mfg Inc
Box 135 West Edge Village
Garfield MN 56332
612-834-2214

Mobay Chemical Corp
Agricultural Chemicals Div
PO Box 4913 Hawthorn Rd
Kansas City MO 64120
816-242-2000

★ Monsanto Co
800 N Lindbergh Blvd (C35D)
St Louis MO 63167
314-694-6640

Montco Products Corp
Box 404
Ambler PA 19002
215-628-3144

Moyer & Son Inc
113 E Reliance Rd
Souderton PA 18964
215-723-6001

Moyer Chemical Co
3321 W Castor St
Santa Ana CA 92704
714-549-2871

MSD AGVET
See Merck & Co

National Bark Sales
1365 N Orchard St
PO Box 7672
Boise ID 83707
208-375-0656

Nepera Inc
Route 17
Harriman NY 10926
914-782-8171

NOR-AM Chemical Co
3509 Silverside Rd
PO Box 7495
Wilmington DE 19803
302-575-2000

North Hampton Seed Co
Box 51
Bath PA 18014
215-837-6311

Oil-Dri Corp of America
520 N Michigan Ave
Chicago IL 60611
312-321-1515

Ozark Landscaping Products
Rt 4 Box 479
Perryville MO 63775
314-547-2531

★ PBI-Gordon Corp
1217 W 12 St
Kansas City MO 64101
816-421-4070

Pennwalt Corp
3 Pkwy
Philadelphia PA 19102
215-587-7286

Perlux Inc
PO Box 1359
Wendell NC 27591

Plant Marvel Laboratories
371 E 16 St
Chicago Heights IL 60411
312-757-7500

Precision Laboratories Inc
333 Anthony Trail
PO Box 127
Northbrook IL 60065
312-498-0800

Prentiss Drug & Chemical Co
21 Vernon St CB 2000
Floral Park NY 11001
516-326-1919

Reclamare Co
20727 Seventh Ave South
Seattle WA 98198
206-824-2385

Regal Chemical Co
PO Box 900
Alpharetta GA 30201
404-475-4837/800-621-5208

★ Rhone-Poulenc Inc
PO Box 125
Monmouth Junction NJ 08852
201-297-0100

Riverdale Chemical Co
220 E 17 St
Chicago Heights IL 60411
312-756-2010

Rockland Chemical Co
686 Passaic Ave
Box 809
West Caldwell NJ 07007
201-575-1322

Rohm & Haas Co
Independence Mall West
Philadelphia PA 19105
215-592-3000

★ O M Scott & Sons Co
14111 Scottslawn Rd
Marysville OH 43041
513-644-0011

SDS Biotech
See Fermenta Plant Protection Co

Sierra Chemical Co
1001 Yosemite Dr
Milpitas CA 95035
408-263-8080

★ Soil Seal Corp
1111 W Sixth St
Los Angeles CA 90017
213-481-7185

Source Technology Biologicals Inc
2850 Metro Dr
Minneapolis MN 55420
612-854-9426 MN/800-Elm-TREE

Southern Mill Creek Products Co
PO Box 420981 Alpatah St
Miami FL 33142
305-635-0321

Sta-Green Plant Food Co
201 W Fourth St
Sylacauga AL 35150
205-245-5282

Stanford Seed Co
Muddy Creek Rd
RD 1 Box 405
Denver PA 17517
215-267-3805

Stull Chemical Co
1006 Paulsun
San Antonio TX 78219
512-227-5255

Sudbury Lawn & Garden Products
301 W Osborn
Phoenix AZ 85013-3928
602-285-1660

Thermoguard Co
412 113th
Arlington TX 76011
817-640-8733

UAP Special Products Inc
13808 'F' St
Omaha NE 68137
402-330-1910

Union Carbide Ag Prod Co
TW Alexander Ave
PO Box 12014
Research Triangle Park NC 27709

Warren's Turf Nursery Inc
Chadbourne & Cordelia Rds
PO Box 459
Suisun City CA 94585
707-422-5100
800-828-8873

Weyerhaeuser
1010 S 336th WSC-3
Federal Way WA 98477
206-927-7900

Wilt-Pruf Products Inc
PO Box 4280
Greenwich CT 06830
203-531-4740

Zoecon Corp/A Sandoz Co
PO Box 10975
Palo Alto CA 94303
415-857-1130

5. Seed Companies

Adelphi Kentucky Bluegrass
PO Box 310
Hollis NY 11423
718-739-4400
Kentucky Bluegrasses: Adelphi; Perennial Ryegrasses: All Star

J & L Adikes Inc
182-12 93rd Ave
Jamaica NY 11423
718-739-4400
Kentucky Bluegrasses: Adelphi; Perennial Ryegrasses: All Star; Turfseed Mexes or Blends: Mixed to order

★ AM Sod Co
2606 Hollister St
San Diego CA 92154
619-428-5567
Fescues: Jaguar Tall; Sod/Sprigs (California & Arizona Only): Tifgreen Hybrid Bermuda Mix, Santa Ana Bermuda, Bluegrass-Ryegrass Mix, El Toro Zoysia

Bamert Seed Co
Route 3 Box 1120
Muleshoe TX 79347
806-272-4787
Other: treated Texoka Buffalo, native grasses

Cenex Seed Co
2882 Howell Prairie Rd Northeast
Salem OR 97305
800-228-4119
Kentucky Bluegrasses: Plush, Holiday; Perennial Ryegrasses: Magnum Brand; Fescues: Bonanza (Tall); Turfseed Mixes or Blends: various mextures, custom blended; Other: public varieties and selected propietary varieties available

Ernst Crownvetch Farms
RD 5 Box 806
Meadville PA 16335
814-425-7276/425-7897
Other: Crownvetch

Daehnfeldt Inc
PO Box 947
Albany OR 97321
503-928-5868
Kentucky Bluegrasses: Melba, Trampas; Perennial Ryegrasses: Polly Hybrid; Fescues: Puma Chewings Other: Wildflowers

Fine Lawn Research Inc
PO Box 290
Madison GA 30650
503-636-2600
Kentucky Bluegrass: Chateau; Perennial Ryegrasses: Pennant; Fescues: Finelawn Turf Type Tall, Jaguar Turf Type Tall; Turfseed Mixes or Blends: Triple Play, Perennial Ryegrass blend

Full Circle Inc
PO Box 49
Madras OR 97741
503-475-3877
Kentucky Bluegrasses: Merit

Garfield Williamson Co
1072 Westside Ave
Jersey City NJ 07306
201-435-3500
Kentucky Bluegrasses: Eclipse, Liberty; Perennial Ryegrasses: Omega II; Fescues: Jaguar Tall, Shadow Chewings; Turfseed Mixes or Blends: Eagle 3 Brand, Proform, Tri-Rye, Eclipse/Omega II, Wonderlawn; Other: Native grasses, wild flowers

Great Western Seed Co
810 Jackson St
Albany OR 97321
503-928-3100
Kentucky Bluegrasses: Common, Baron, Nassau, Mystic, Georgetown, Ram I; Perennial Ryegrasses: Palmer, Prelude, Cowboy, Diplomat, Repell, Yorktown II; Fescues: Clemfine, Rebel, Rebel II (Tall) Jamestown (Fine); Turfseed Mixes or Blends: Marvelgreen Line (many formulas), Par 3 (perennial ryegrass)

Jonathan Green Inc
Squakum-Yellowbrook Rd
PO Box 326
Farmingdale NJ 07727
201-938-7007 NJ/800-526-2303
Kentucky Bluegrass: Adelphi, A-34, America, Baron, Banff, Birka, Classic, Columbia, Eclipse, Enmundi, Enoble, Flyking, Glade, Gnome, KenBlue, Common, Merion, Nassau, Merit, Monopoly, Parade, Ram I, Reubens, Sabre; Perennial Ryegrasses: Allstar, Blazer, Citation II, Dasher, Fiesta, Jazz, Manhattan II, Pennfine, Linn, Premier; Fescues: Agram Chewing, Bargena Creeping, Bonanza Tall, Creeping Red, Finelawn I Tall, Houndog Tall, Jamestown Chewing, Kentucky 31 Tall, Mustang Tall, Pennlawn Creeping, Sparta; Bentgrasses: Asoria, Emerald, Exeter, Penncross, Penneagle, Pennway, Hard, Tournament Hard, Victory Prominent, Seaside, Sheeps Fescue; Turfseed Mixes or Blends: Perennial

NEW! RAVENS MAINTENANCE FREE UTILITY TRAILERS The Ravens all-aluminum frame utility trailers are sized from 4' x 6' to 6' x 10' to meet your individual transport needs. Lightweight. Will not rust. Eliminates yearly scraping and painting. Looks new season after season.

- 1500 lb. capacity
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Distributor and dealer inquiries welcome.

RAVENS

RAVENS METAL PRODUCTS, INC.
P.O. BOX 1168 PARKERSBURG, WEST VIRGINIA 26102

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Circle No. 157 on Reader Inquiry Card

★ Advertiser. See Advertiser's Index

Ryegrass, Drought Tough Mixture, Blue-Rye, Full Sun Grass Seed, Funlawn Turf-Type Tall Fescue, Fast Grow, Bentgrass, Pennway Bentgrass; Other: Birdsfoot Trefoil, Blackwells Switchgrass, Alsike, Red, White, Ladino Clovers, Penngift Crownvetch, Tioga Deertongue, Orchardgrass, Redtop, Reeds Canarygrass, Sericia Lespedeza, Timothy, Weeping Lovegrass, Pinto Wildflower, Winter Rye

Geo W Hill & Co
8010 Dixie Hwy
Florence KY 41042
606-371-8423
Kentucky Bluegrasses: Eclipse, Chateau; Perennial Ryegrasses: Pennant; Fescues: Finelawn Turf-Type Tall, Jaguar Turf Type Tall; Turfseed Mixes or Blends: Triple Play Perennial Ryegrass Blend

★ International Seeds Inc
820 First St
PO Box 168
Halsey OR 97348
503-369-2251
Kentucky Bluegrasses: Vantage; Perennial Ryegrasses: Derby, Regal, Gator; Fescues: Highlight (Chewing), Red, Ensylva (Creeping), Houndog (Tall); Bentgrasses: Emerald, Penncross, Penneagle; Turfseed Mixes or Blends: Dixie Green Mix, Dixie Green/Sabre Mix, Ph D Overseeding Blend, Ph D/Sabre

★ Jacklin Seed Co
W 5300 Jacklin Ave
Post Falls ID 83854
208-773-7581
Kentucky Bluegrasses: Nugget, Glade, Adelphi, Eclipse, Classic, Amazon, A-34, Geronimo, Huntsville, Nassau, Ram I, Cheri; Perennial Ryegrasses: All Star, Manhattan II, Pennfine; Fescues: Arid (Tall), Logro, Highlight, Ensylva; Bentgrasses: Penncross, Seaside, Penneagle; Other: Environmental; Reubens Canada Bluegrass, Streaker redtop, Covar Sheeps fescue

★ Lesco Inc
20005 Lake Rd
Rocky River OH 44116
216-333-9250
Kentucky Bluegrasses: Dawn, Julia; Fescues: Cimmarron (Tall); Turfseed Mixes or Blends: Eagle, Lesco Shade Mix, Transition

★ Loft Seed Inc
Chimney Rock Rd
PO Box 146
Bound Brook NJ 08805
201-356-8700
Seed Types: Clemfine Tall Fescue, Rebel Tall Fescue, Prelude & Palmer Perennial Ryegrasses, Diplomat & Yorktown II Perennial Ryegrasses, Baron & Ram I KY Bluegrasses

Mangelsdorf Seed Co
1415 N 13 St
St Louis MO 63106
314-421-1415
Kentucky Bluegrasses: Arboretum etc.; Perennial Ryegrasses: Omga II, etc.; Fescues: KY 31, Jaguar Turf Type, Creeping Red and Chewings fescue; Bentgrasses: Penncross, Penneagle, Emerald, Highland; Turfseed Mixes or Blends: M-Brand & custom mixes; Other: Zoysia & Crownvetch Seed; Sod/Sprigs (South only): Crownvetch Crowns

Normarc Seeds Inc
32080 Hwy 34
Tangent OR 97389
503-926-5801
Kentucky Bluegrass: Merit, Park, Newport; Perennial Ryegrasses: Premier; Fescues: Tempo, Pennlawn Creeping, Cascade Chewing, Koket, Fawn Tall; Bentgrasses: Penncross, Highland, Seaside; Turfseed Mixes or Blends: Turf Star, Perennial Ryegrass Mix

Northampton County Seed Co
646 Georgetown Rd
Nazareth PA 18064
215-837-6311
Kentucky Bluegrass: Common, Nassau, Glade, Birka, Baron; Perennial Ryegrasses: Linn, Derby, All Star, Pennfine; Fescues: Koket Chewing Red, Pennlawn Creeping Red, Creeping Red, Kentucky 31 Tall, Falcon Tall; Bentgrasses: Penneagle, Penncross; Turfseed Mixes of Blends: Country Brand I-50% Creeping Red fescue, 25% K. B., 25% Annual Ryegrass; Shale mix-50% Creeping, 50% Derby Perennial; White Dutch Clover; Crownvetch; Poa Trivialis; Red Top; Farm Seed

★ Northrup King Co
Medalist Turf Div
7500 Olson Memorial Hwy
PO Box 959 (55440)
Minneapolis MN 55427
612-781-8011
Kentucky Bluegrasses: Adelphi, Aspen, Aquila, Parade, Park, Rugby; Perennial Ryegrasses: Delray, Eton, Goalie, NK200, Pennfine; Fescues: Atlanta chewings Dawson red, Ruby creeping, Scaldis hard, Galway turf-type tall; Bentgrasses; Penncross, Penneagle, Seaside; Turfseed Mixes or Blends: Special Park Mix, Premier Turf, Swift & Sure, Athletic Pro I & II, Shady Turf, Premium Sod Blend, Overseeder II, Medalist North, Landscape Pro, Landscape Pro West, Boulevard Mix, Renovator Pro Blend, Super Pro III, Alkali Turf Mix, Medalist Overseeding Blends; Other: Fults Puccinellia distans Alkaligrass

Nutri-Turf
10777 Sunset Office Park
St Louis MO 63127
314-822-6571
Fescues: Rebel Chewings; Other: Centipede; Sod/Sprigs (South Only): St Augustine, Hybrid Bermuda, Zoysia

Oregon Fine Fescue Commission
2140 Turner Rd SE
Salem OR 97302
503-585-1157
Fescue: creeping and chewings

Oregon Ryegrass Growers Seed Commission
4093 12th St Southeast
Salem OR 97302
503-364-3346
Perennial Ryegrasses: Oregon Ryegrasses; Other: Annual Ryegrasses

★ Oregon Tall Fescue
2140 Turner Rd SE
Salem OR 97302
503-585-1157

Oseco Inc
PO Box 219
Brampton ON Canada
L6V 2L2
416-846-5080
Kentucky Bluegrass: Baron, Gnome, Haga, Midnight, Nassau, Sydsport, Regent, Majestic; Perennial Ryegrasses: Palmer, Yorktown II, Barry; Fescues: Banner Chewings, Koket Chewings, Rebel Tall, Biljart Hard, Reptans Red, Fortress Creeping; Bentgrasses: Penneagle, Emerald; Turfseed Mixes or Blends: PHD-1, PHD-2, PHD-3; Other: PHD-1 Rapidgrass

Patten Seed Co
119 Murrell Ave
Lakeland GA 31635
912-482-3131
Other: Centipedegrass Seed; Sod/Sprigs (South Only): Meyer Zoysia, Emerald Zoysia, Tifton Hybrid Bermudas, Centipede, St Augustine

Pennfine Perennial Ryegrass
500 Olson Memorial Hwy
Minneapolis MN 55427
612-781-8011
Perennial Ryegrasses: Pennfine

Peterson Seed Co
PO Box 346
Savage MN 55378
612-445-2606
Kentucky Bluegrasses: Monopoly, Classic

Otto Pick & Sons Seeds Ltd
11151 Yonge St
Box 126
Richmond Hill ON Canada
L4C 4X9
416-884-1147
Kentucky Bluegrasses: America, Banff, Nugget, Touchdown; Perennial Ryegrasses: Blazer, Fiesta; Fescues: Agram, Mustang, Tournament hard; Bentgrasses: Exeter

Otto Pick & Sons Seeds Ltd
RR 2 Box 4 Group 200
Winnipeg MB Canada
R3C 2E6
204-633-0088
Kentucky Bluegrasses: Nugget, Touchdown, A34, America, Ram I, Banff, Cheri, Fylking, Dormie, Baron, Common SQ/QT 98/85, Park; Fescues: Agrams

Chewings, Jamestown Chewings, Pennlawn Creeping, Bareal Creeping, Tournament Hard; Sheeps Ovina, Mustang Tall; Bentgrasses: Penncross Perennial

Pickseed West Inc
PO Box 888
Tangent OR 97389
503-926-8886
Kentucky Bluegrasses: America, Banff, Touchdown; Perennial Ryegrasses: Blazer, Dasher, Fiesta, Jazz; Fescues: Mustang & Maverick (tall), Agram (chewing), Spartan & Tournament (hard); Bentgrasses: Exeter (colonial); Turfseed Mixes or Blends: Futura Plus, Futura Blue; Other: Colt Poa trivials, Flowers 'n' Flowers, Flowers 'n' Grass

Pioneer Hi-Bred International
See Peterson Seed Co

Prairie Seeds Ltd
RR 1
South Edmonton AB
Canada T6H 4N6
403-955-7345
Kentucky Bluegrasses: Baron, Glade, Eclipse, Nugget, Ram I, Regent; Perennial Ryegrasses: Derby, Manhattan; Fescues: tall, chewings, creeping; Bentgrasses: Penncross, Penneagle, Prominent; Turfseed Mixes or Blends: Custom; Other Turf Seed: Alpine Bluegrass, Tufted Hairgrass

Pro-Lawn Products Inc
PO Box 4908
Syracuse NY 13221
315-477-6007
Kentucky Bluegrasses: Rugby; Perennial Ryegrasses: Pennfine, Palmer; Fescues: Jaguar Tall Fescue, Rebel Tall Fescue; Turfseed Mixes or Blends: Professional Green, Royal Green, Wear Green

Roberts Seed Co
PO Box 206
Tangent OR 97389
503-926-8891
Kentucky Bluegrasses: Newport, Park, Merion; Perennial Ryegrasses: Pennfine, Manhatten, Linn; Fescues: Cascade, Pennlawn, Rainier Red; Bentgrasses: Astoria, Seaside, Highland

Rothwell Seeds Ltd
PO Box 511
Lindsay ON
Canada K9V 4S5
705-324-9591
Kentucky Bluegrasses: Adelphi, Argyle, Classic (225), Eclipse, Glade, Monopoly, Julia, Regent, Geronimo, Harmony, Welcome Midnight, Nugget, Park, Vantage; Perennial Ryegrasses: Manhattan, Derby, Diplomat, Prelude, All*Star, Pennant; Fescues: Barfalla Chewings, Koket Chewings, Durlawn Creeping Res; Bentgrasses: Penncross, Penneagle, Prominent, Bardot, Carmen, Seaside, Highland, New Zealand Brown Top, Astoria; Other: seeds of most adapted northern species, both for turf & agriculture, soil stabilizers & ground cover

★ O M Scott & Sons Co
14111 Scottslawn Rd
Marysville OH 43041
513-644-0011
Kentucky Bluegrasses: Victa, Bristol, Merit; Perennial Ryegrasses: Loretta, Pennant, Ovation, Caravelle, Derby, Pennfine, Proturf; Fescues: chewings: Jamestown, Banner, Improved Tall: Falcon, Mustang, Chesapeake; Bentgrasses: Penncross, Penneagle, Emerald, Seaside; Turfseed Mixes or Blends: Uicta/Bristol/Merit, Winter Turf Overseeding, Sportsturf, Utility; Other: Sabre Pia Trivialis

Seed Production & Introduction Corp
7500 Olson Memorial Hwy
Minneapolis MN 55427
612-781-8011
Kentucky Bluegrasses: Rugby; Perennial Ryegrasses: Pennfine

Seed Research of Oregon
644 SW 13 St
Albany OR 97333
503-757-2663
Kentucky Bluegrass: Enmundi, Harmony, Merit; Perennial Ryegrasses: SR 4000, SR 4100; Fescues: Trident, SR 8000, SR 8100; Bentgrasses: Prominent Creeping, SR 1019 Creeping, SR 1020 Creeping; Turfseed Mixes or Blends: Champion, Trophy, Endurance, Survivor

Southern Turf Nurseries
5172 A Indian Trail Ind Pkwy
Norcross GA 30071
404-448-9932
Sod/Sprigs (South Only): Tifway, Tifway II, Tifgreen, Tifwarf, Midiron bermudagrasses, Meyer, Emerald Zoysiagrasses

Southern Turf Nurseries Inc
PO Box 1459
Lake Wales FL 33853
813-537-2149
Sod/Sprigs (South Only): Hybrid Bermuda Springs & Sod; Grassing Contractor

Stanford Seed Co
Buffalo NY 14240
716-825-3300
Seed Types: Koket Chewings Fescue, Old English, Crown Vetch, Pennfine Perennial Ryegrass, Rugby KY Bluegrass

Stanford Seed Co
Muddy Creek Rd
RD1 Box 405
Denver PA 17517
215-267-3805
Kentucky Bluegrasses, Perennial Ryegrasses, Fescues, Bentgrasses, Turfseed Mixes or Blends, Other, Sod/Sprigs: Old English

Sunbelt Seeds Inc
5172 Indian Trail Ind Pkwy
Ste A
Norcross GA 30071
404-448-9932
Kentucky Bluegrass: Baron, Nassau, Ram I, Georgetown, Mystic; Perennial Ryegrasses: Palmer, Prelude, Cowboy, Repell, Yorktown II, Agree; Fescues: Rebel Turf Type, Clemfine Turf Type Tall, Jamestown Fine, Reliant Fine; Bentgrasses: Penncross, Penneagle, Emerald, Seaside; Turfseed Mixes or Blends: Marvelgree series; Other: Bermudagrass, Centipedegrass, wildflower mixes

★ Tee-2-Green Corp
PO Box 250
Hubbard OR 97032
503-981-9574
800-547-0255
Bentgrasses: Penncross (Creeping), Penneagle (Creeping)

★ Turf Merchants Inc (TMI) 30065 Hwy 995
PO Box 1467
Albany OR 97321
800-421-1735/503-491-3622
Kentucky Bluegrass: Gnome, Tendos, Rugby; Perennial Ryegrasses: Pennfine, Manhattan II, Rodeo, Barry; Fescues: Vitrus Creeping, Regans Chewings, Brookston Tuft Type Tall, Turfgem Turf Type Tall, Gremlin Dwarf Turf Type Tall; Bentgrasses: Seaside Creeping; Turfseed Mixes or Blends: V I P Turf Type, V I P Creeping, TrueBlue Kentucky

★ Turf Seed Inc
PO Box 250
Hubbard OR 97032
503-981-9571
Kentucky Bluegrasses: Columbia, Sydsport, Midnight, Challenger; Perennial Ryegrasses: Citation II, Omega II, Birdie II, Manhattan II, CBS II Blend, 2DF, 3CN; Fescues: Flyer Creeping, Triathelawn Blend Tall, Shadow Chewings, Aurora Hard, Bighorn Sheep, Olympic Tall, Apache Tall; Bentgrasses: Penncross, Penneagle; Turfseed Mixes or Blends: CBS II, Triathelawn

Vaughan's Seed Co
5300 Katrine Ave
Downers Grove IL 60515
312-969-6300
Seed Types: Adelphi KY Bluegrass, Citation Perennial Ryegrass

Vaughan's Seed Co
Chimney Rock Rd
Bound Brook NJ 08805
201-356-4200
Seed Types: Adelphi KY Bluegrass, Glade KY Bluegrass, Cheri KY Bluegrass, Merit KY Bluegrass, Touchdown KY Bluegrass, Pennant Perennial Ryegrass, Citation Perennial Ryegrass, Regal Perennial Ryegrass

Warren's Turf Nursery Inc
Chadbourne & Cordelia Rds
PO Box 459
Suisun City CA 94585
707-422-5100
Kentucky Bluegrasses: A-34 BenSun, Warren's; Fescues: Adventure turf type (Tall)

★ Advertiser. See Advertiser's Index

PROBLEM SOLVERS

by Balakrishna Rao, Ph.D

Diagnosing sap flow problems

Problem: *A number of elm trees are showing some kind of sap flowing on the trunk. We think it is wetwood. Are there any other problems similar to wetwood? Is drain tube installation still recommended for wetwood problems? (Illinois)*

Solution: Yes, there are some other problems which can produce sap flow, in addition to wetwood disease. For example, sap flow is associated with flux, slime flux, wetwood, and alcoholic slime flux problems.

Whenever a cut is made on trees, sap begins to flow. This is called flux. This is usually severe in spring because of heavy sap flow. Often many different bacteria or yeast can get into this flux which is then referred to as slime flux. Slime flux is primarily on the surface and it does not go beyond the cambium layer. Since neither flux nor slime flux are inside the plant, there is no need for treatment.

Alcoholic slime flux, a bacterial disease, is generally found on white oaks. Reports indicate that this problem can also occur on beech trees. This problem can be managed by bark tracing the affected areas.

Wetwood disease on American elm is caused by a specific bacterium (*Enterobactor sp.*). Affected trees may show chronic "bleeding" from crotches and wounds. The bacteria infects the sapwood and heartwood and then ferments the sap, releasing gases which create pressure build-up within the tree. This pressure causes the sap to flow out at crotches or near wounds. This fermented sap is toxic.

As a result, the "bleeding" wounds may not heal and often the bark tissues under the area of sap flow may be injured. Many insects may be attracted to fermented sap. This problem can be treated by making a downward slanting hole ($^{15}/_{16}$-inch in diameter through the trunk) and inserting a brass pipe into the hole (just far enough to hold it securely).

The drain tube should be installed below the bleeding site so that the sap will drip on the ground and away from the trunk. Copper tubing should not be used since it is toxic to the trees. Often the sap flowing from these tubes may kill grass or ground cover around the drip sites. Install one tube per 12-inch DBH tree or two to three tubes per 24-inch diameter tree at the base.

Power raking to reduce thatch

Problem: *Why power rake since it does little to reduce thatch? (Colorado)*

Solution: Although it may appear that power raking does little to reduce thatch, it can be beneficial if done properly. For best results the lawn should be raked several times. Periodically check the thatch level with a probe, and continue power raking until the thatch is reduced to the desired level.

Because of the nature of this operation, it may be damaging to lawns. Modifying the thatch layer by core aerification is less disruptive to turf. With this method, the thatch barrier will be broken and the cores will bring the soil above the turf. Ideally, these cores should be broken to reintroduce the soil containing micro-organisms which are needed for thatch decomposition.

Aerating fairways and roughs

Problem: *What are the most effective and most efficient methods of core aeration of a fairway or rough? What is the fastest method? Can this material be used for future construction? (New York)*

Solution: Tractor-mounted aerifying equipment would be the most efficient for removing core aeration plugs in a fairway or rough. The effectiveness of the method can be affected by the soil moisture and cutting height. Often fairways and roughs are cut a little longer than the greens, which would reduce the penetration of tines. Also, if the soil is dry, tine penetration is reduced. Walk-behind type aerifiers are not practical for the fairways and rough areas because of the large area to be covered.

The plugs pulled out during aerification would contain some plant material and soil. In most cases, these are left on the ground and allowed to break down slowly and incorporated back into the turf. However, if the plugs are collected, they can be used for future construction.

Roundup and poison ivy control

Problem: *Can Roundup be used to control poison ivy plants? Some are growing on tree trunks. When is the best time to treat? (Ohio)*

Solution: Roundup can be used to control poison ivy plants. A representative from the Monsanto Company, manufacturers of Roundup, indicates that an application of 2 percent solution when the plants begin to turn leaf color in late summer or fall would provide effective control of poison ivy within seven to 10 days. If the plants are growing up a tree, one must try to cut down most of the vines and then apply the treatment. Avoid any material drifting onto green tissue of non-target, desirable plants because Roundup can cause injury. Read and follow label specifications for best control.

Balakrishna Rao is Director of Lawn Care Technical Resources for The Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Solver, Weeds Trees & Turf, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

Reconditioned sweepers offer low-cost service

Reconditioned Tennant sweepers can mean extra savings and expanded services to the landscaper and lawn care operator.

Reconditioned sweepers can be used to clean and maintain parking lots, access roads, sidewalks, and other hard outdoor surfaces.

The wide variety of walk-behind and rider sweepers are reconditioned by factory-trained mechanics in authorized Tennant Company service centers, according to Tennant. The machines pass rigorous performance tests to guarantee that all systems work properly. They come with a 90-day warranty on all components except normal wear items.

Circle No. 190 on Reader Inquiry Card

Lesco spreader makes granular application easy

Lesco's gasoline-powered, hydraulic-driven spreader enables the operator to select a constant speed, from zero to four miles per hour, thus providing a constant rate and a cost savings.

For application of granular material, the Lesco spreader features an 80-pound capacity polyethylene hopper, corrosion-resistant Delrin 100 gears, and third hole on shut-off plate with adjustable metering slide for varying product bulk densities.

The spreader is powered by a 3-hp recoil Briggs & Stratton Industrial-Commercial engine. A hopper cover to protect the product and allow transportation without spillage is available as an option.

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Jiffy Lift makes mower servicing easier

The Jiffy Lift can alleviate the problem faced by many lawn mower repairmen: how to lift the mower and then suspend it to make the necessary repairs.

With the Jiffy Lift, the mower is clamped in the lift so that it is suspended in space without any obstructions to interfere with work to be performed. Any working level up to five feet is possible. The Jiffy Lift is available in different sizes and models.

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Circle No. 103 on Reader Inquiry Card

Conversion to dual fuels can mean savings

A program that helps save money and trains students — that's one of many reasons why Hocking Technical College in Nelsonville, Ohio, remains a stable institution.

The two-year college is moving toward energy self-sufficiency through vehicle conversion to dual fuels—traditional gasoline and natural gas. The program also serves as a student training program. At Hocking Tech, a student learns and produces.

The school's vehicle fleet is undergoing natural gas conversion, taking advantage of the school's abundant supply. Hocking Tech draws from nine producing wells located on the college's 250 acres.

(Students are also trained in oil-well drilling and production on both rotary and cable tool rigs, while at the same time providing natural gas.)

The converted vehicles include those driven by admissions counselors visiting high schools throughout the state and buses transporting students to campus.

Hocking Tech president Dr. John J. Light drives a vehicle sporting a "powered by natural gas" sticker in the back window.

The conversion doesn't stop there. A truck and sprayer have recently been converted to natural gas. Both were a gift from the Davey Tree Company of Kent, Ohio (February, 1986, WT&T).

Hugh Morton, director of the Institute for Forest Industries Training at Hocking Tech, says that conversion is especially important.

"The truck and sprayer are used in residential areas and the engine is left running while the spraying is being done," he says. "Natural gas is clean burning and will emit far less pollutants in the air."

Tanks for storing natural gas are installed as a part of the conversion to dual fuel operation by participants in a seminar on natural gas conversion at Hocking Technical College in Nelsonville, Ohio.

Students attending the publicly-funded college can obtain a degree in tree care and timber harvesting, that includes an intensive 11-week program in tree care.

Clean burning is just one advantage of natural gas, says Jerry Hutton, director of the automotive and oil well drilling and production programs.

"The alternate fuel has an outstanding ability to start in cold weather and because the ignition temperature is 300 degrees higher than gasoline, it's safer. Because it's lighter than air it rises into the atmosphere," says Hutton.

Longer engine life is also a feature of natural gas conversion.

Hutton says the cost of converting the truck and sprayer was $2,300.

He notes a fleet of five vehicles can make conversion cost-efficient.

The process is gaining support not only for those seeking energy self-sufficiency but for larger fleet owners such as international airports and taxi delivery companies throughout the U.S. and Canada.

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BOX NUMBER REPLIES: Mail box number replies to: WEEDS TREES & TURF, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

Established Colorado grounds maintenance business; good reputation in community; 1700 customers; profitable; $165,000. Rhys Christensen, (303) 493-7990. 9/86

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7726. TF

HELP WANTED

Millikin University is seeking a Supervisor of Grounds. Primary responsibility includes care of lawns, athletic fields, trees and shrubs on campus. Preference will be given to persons having a successful experience in supervision and management roles with a thorough knowledge of pruning, pest control, fertilization, turf grass maintenance. Possession of an Illinois Certified Pesticide Applicator License or ability to obtain within three months of employment. A degree in Horticulture is preferred. Submit resume to: Millikin University Personnel Office, Decatur, IL 62522. An EEO employer. 9/86

PROJECT MANAGER: Excellent opportunity for career and goal oriented individual to work with a commercial landscape firm in Atlanta, Georgia. Must be experienced in all aspects of landscape construction and willing to assume total responsibility. Good salary, benefits and incentive program. Scapes,Inc., 404-956-7500. 10/86

HELP WANTED: Land Estimator - KT Enterprises, Inc. is expanding its landscape installation department & has a challenging new position in our fast growing firm for the right person with exceptional sales ability. Must be experienced in take-offs and costing. Progressive design/build firm doing business in Washington, D.C. Metro area. Excellent salary, benefits & growth potential. Call John Warren 703-922-8540. 9/86

CHAIRPERSON GOLF COURSE/LANDSCAPE PROGRAMS: Master's degree in Plant/Soil Sciences, Business/Public Administration and two years' experience in Golf Course/Landscape Operations. Earned Doctorate preferred. Responsibilities include student recruitment, administration, public relations w/industry, student placement, supervision of faculty/staff, minimal teaching. Salary negotiable based on experience/qualifications. Deadline: Open. Send resume to Lake City Community College, Rt. 3, Box 7, Lake City, Florida 32055. (904)752-1822 ext. 313. EA/EO EMPLOYER. 9/86

Landscape Architects/Supervisors (project foremen) join a nationally acclaimed firm looking to expand into its second generation Long Island area supports a high budget landscape industry. Year round employment, company benefits and continuing education available. Experienced and aggressive people send resume to: **GOLDBERG & RODLER, INC.**, 216 East Main Street, Huntington, New York 11743. 10/86

Landscape Maintenance Foreman: South Florida firm seeking individuals who are experienced in all aspects of maintenance including irrigation. Send resume to: G & E, 4540 S.W. 75th Ave., Miami, FL 33155. 9/86

Sales Professional: To the Greens Industries in Mid-Atlantic region; must have "2 years" sales experience selling to lawn care, landscape, and tree care firms. A good knowledge of the business and customer's needs is necessary. Excellent compensation package offered. Please send resume to: Moyer & Son, Inc., 113 East Reliance Road, Souderton, Pennsylvania 18964. Attn: Specialty Fertilizer. 9/86

AGRONOMIST - Lawn Doctor, the nations leader in franchise lawn care, is seeking an individual to join our national staff. Position involves working with franchises on turf program development, training, safety, and regulation. BS Agronomy with warm and cool season turf experience and strong communication skills required. Must be willing to travel and relocate. Resume and salary history to Lawn Doctor, P.O. Box 512, Matawan, NJ 07747. 9/86

An extremely progressive private Country Club in St. Louis is seeking a Greens Superintendent. Must excell in training, follow through and organization. Hands on experience and knowledge of soils, chemicals, irrigation, manicuring, equipment and turf, especially Zoysia is essential. We are seeking a professional that is dedicated to excell. Excellent salary and outstanding benefits. Send resume only (No Calls Please) to: Westborough Country Club, 631 South Berry Road, St. Louis, MO 63122. 9/86

Irrigation Designer & Installation Supervisor—Experience a must!! Send resume to P.O. Box 157, Fairburn, GA 30213. 9/86

EASTERN NEW YORK AND VERMONT IRRIGATION MANAGER —Seeking qualified manager for full time position to build up Irrigation sales to Golf Courses, Municipalities, Residential/Commercial Contractors. Must have some knowledge of design. All company benefits. Please respond to: President, GEI, WTT Box 396. 9/86

GOLF COURSE SUPERINTENDENT - 18 hole, daily fee course located in Western Illinois seeks a knowledgeable and enthusiastic Superintendent to assume responsibility 12-1-86. Budgeting, planning, supervisory skills, turf grass and problem solving skills required. Please send a written resume along with salary requirements to WTT Box 398. 9/86

LANDSCAPE MANAGEMENT SALES REPRESENTATIVE — Opportunity for Right Person - Join an established firm with 40 years in Landscape Field. Located in Midwest - large metro-area. Position requires an understanding of Green's Industry - in particular Landscape Management. Individual must have 2 years experience with 1 year minimum in commercial maintenance operation. Position involves sales to large residential clients and development of commercial sales to large residential and development of commercial market. Established list of accounts will be provided - salary based on commission. Send resume to WTT Box 397. 9/86

MS Entomology/30 years experience in Pest Management of Horticulture, plants, trees and turf. Was selected in top 50 ag-consulting firms of U.S. Contract research with all pesticides, P.G.R., biotech compounds, fertigation and application techniques. Interested in contracts or employment with epanding firms in Western U.S. (AZ and CA). P.O. Box 4781, Yuma, AZ 85364. 9/86

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If you are a creative, aggressive person with experience in turf management, and possess good communication skills, a B.S. degree in Agronomy or related degree, we would like to speak with you.

We can offer the compensation you would expect from a company that recognizes its employees as its most important asset. For consideration, send your resume to: **NUTRI-TURF, INC.; One of the Anheuser-Busch Companies; Corporate Employment; Department BAR-J; One Busch Place; St. Louis, Missouri 63118.** An Equal Opportunity Employer M/F.

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Fleet Superintendent/Equipment Coordinator to perform maintenance on diesel/gas equipment 80 h.p to 1 h.p. and coordinate the use of equipment for a grounds maintenance service company throughout the state of Florida. Please send resume to Quandt-Ayer Enterprises, P.O. Box 271880, Tampa, FL 33688. 1/87

FOREMAN LANDSCAPE/ARBORIST: Excellent pay and benefits package. Immediate increase over your current salary. MCA and pesticide license helpful. Must be experienced in shade tree and ornamental pruning, planting and removals. Should be able to organize and lead a crew. Needham, MA. Call 617-444-0994. 9/86

Sales and Service person needed in Virginia Beach area. Only experienced, licensed applicators with excellent customer service skills will be considered. Send resume and references to: Lawn Medic of Tidewater, P.O. Box 1786, Chesapeake, VA 23320. TF

SALES AND SERVICE: Rapidly expanding Central Florida turfgrass producer requires knowledgeable person to assume all marketing functions. Salary plus bonus and benefits. Our employees know of this ad. Reply to WTT Box 399. 9/86

Manager of National Landscape Division

Barefoot Grass Lawn Service is looking for a Horticulturist to develop and manage our national Landscape Division. The right person will have a thorough knowledge of landscape horticulture as it applies to various regions nationwide.

If your technical expertise and job experience demands challenge and growth within an executive management environment, we want to talk with you.

If you have a Ph.D. in Horticulture, a related science, or an MS and appropriate work experience, send your resume and salary history to: W. Page Mays, Jr., Vice President of Operations, Barefoot Grass Lawn Service, Inc., 1018 Proprietors Rd., Worthington, OH 43085.

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Irrigation Specialist to manage Irrigation Division for Commercial Landscape Contractor in the Washington, D.C., Baltimore, Maryland area. Experience should include 2 years field related experience, management skills, sales ability. Excellent salary and benefits with bonus option. All applications held in strictest confidence. Forward resume to: Personnel Administrator, P.O. Box 10862, Rockville, MD 20850. 9/86

HELP WANTED—PESTICIDE APPLICATOR—

Position for trained, educated and experienced Turf and Ornamental Applicator to work with a grounds care corporation. The general scope of the work will include diagnosis and control of insects and disease on bluegrass and ornamental shrubs. We offer excellent benefits and the opportunity to work with immanent professionals. Send resume and salary history.

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LANDSCAPE CONSTRUCTION SUPERVISOR—Rapidly growing mid-south landscape contractor is seeking a well-trained, self-motivated individual for its new division office. Five years minimum experience with knowledge of scheduling, purchasing in multi-crew supervision. Send job and salary history to: Reinhold Landscape, 3388 Cazassa, Memphis, Tennessee 38116. 9/86

HELP WANTED-A diversified growing landscape company in the Northeast is looking for experienced people for Landscape Design, Construction and Maintenance as Supervisors and Managers. Salary to be determined by experience. Send Resume including work and salary history to: Control Env. Services, Inc., 2605B Durham Road, Bristol, PA 19007, Attn: J.R.B. 9/86

LANDSCAPE MAINTENANCE. Top notch Washington D.C. area landscape firm is looking for a responsible foreman to do residential maintenance, emphasizing quality tree, shrub and bed care. We are also seeking a spray technician trainee to assist with our integrated pest management program etc. Good pay with benefits. No weekend work. Willingness to work hard and produce is essential. Related education or experience preferred. Send resume and references to: Garden Gate Landscaping, 821 Norwood Road, Silver Spring, MD 20904. 9/86

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2 - 1985 International 1654 Series Chemlawn Style Units—(1) Tree and lawn spraying combination unit, 6.9 liter diesel 1250 split tank, 2 hose reels with 300 feet of hose each, 50 GPM trees and 10 GPM lawn, 15,000 miles, like new condition, $20,995. Lawn Spraying Unit—6.9 liter diesel 1250 gallon split tank, 100 gallon bullet tank, 2 hose reels with 300 feet of hose each, 10 GPM, 15,000+ miles, like new condition, $19,995. Call Paul at 516-231-9092. 10/86

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AD INDEX

NO.	ADVERTISER	PAGE
101	Agro-Chem. Inc.	74
102	Am-Sod/Germain	121
103	Atwater Strong Div.	136
104	Aquatrols Corp. of Amer.	59
105	Aquatrols Corp. of Amer.	111
106	BASF Corp.	CV3
107	Bowie Industries Inc.	82
108	Brillion Iron Works Inc.	110
109	Brouwer Turf Equip. LTD.	63
110	Bunton Co.	97
111	Cellin Mfg. Inc.	80
112	Chevron Chem. Co.	105
	Ciba-Geigy Corp. (reg.)	135
114	Cushman Eagle	53
115	Dedoes Industries Inc.	116
116	John Deere & Co.	38-39
117	Dow Agricultural	CV2-p.1
118	Dupont-Landscape Fabric	47
119	Earl Crane Inc.	110
175	Elanco Landscape Handbook	9-34
120	Estech Inc.	7
121	Excel Industries	57
122	Exmark Mfg. Co.	104
253	E-Z-Go/Div. of Textron	94-95
124	Fairmont Hydraulics	99
126	Finn Corp.	113
127	Ford Tractor Operations	69
128	Goossen Industries	98
129	Grasshopper Co.	91
130	Hahn Turf Prod.	71
131	Hannay Reels	88
132	International Seed	65
133	Jacklin Seed Co.	92
134	Jacobsen/Div. of Textron	101
125	F.D. Kees	36
135	Kut-Kwick	79
136	Lesco Inc.	84-85
137	Lesco Inc.	3
138	Lofts Inc.	CV4
141	Milliken Chemical	37
142	Monsanto Agri. Products	66
143	Merck & Co. Inc.	141
144	National Mower Co	102-103
145	Northrup King	109
146	NPI	129
147	Olathe Mfg. Inc.	137
148	Olathe Mfg. Inc.	141
149	O.M. Scott & Sons	87
150	O.M. Scott & Sons-Hybrid	54-55
151	O.M. Scott & Sons-POA	54-55
153	Oregon Tall Fescue	104
	Outdoor Equipment Co. (reg.)	135
154	PBI Cordon Corp.	48-49
155	Phillips Fibers Corp.	93
156	Ransomes Inc.	83
157	Raven Metal Prod. Inc.	132
252	Reinco	70
159	Rhone-Poulenc Inc.	107
160	Soil Seal Corp.	136
161	Standard Golf Co.	117
162	Supreme Corp.	61
163	Tee-2-Green	81
164	Tecumseh Products Co.	77
165	Teledyne Total Power	108
166-168	Tennant	115
169	Toro Company	4-5
139	Turf Merchants	51
171	Turf Seed	89
170	Trebor Corp.	78
172	Wells Cargo Inc.	116

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Circle No. 143 on Reader Inquiry Card

Images of grief

Images. Most bombard the brain, evaporating quickly into oblivion. But some grab you, creeping into your thoughts throughout an otherwise routine day.

As I watched a baseball game played on artificial turf, I couldn't shake the memory of the tears in Alan Halbrook's eyes as he told me about Scott, who died when his head hit the artificial turf during baseball practice. "He was my son," he said softly, his lips quivering in an effort to hold back the tears. "How many kids get a baseball field named after them?" (Marist High School in Eugene, Ore., named the field in Scott's memory.)

As I caught a glimpse of the PGA Tour, I remembered the hope in Kent Waldrep's voice as he described how he'll swing a golf club *when* his paralysis is cured. Kent was left quadripeligic in a fall on artificial turf during a college football game.

Their stories are sad. The images, haunting. The results, courageous.

Waldrep runs the Kent Waldrep National Paralysis Research Foundation in Dallas, which raises money to find a cure for paralysis. He speaks out against artificial turf, suggesting Prescription Athletic Turf as a viable alternative. "I'm not convinced that system couldn't be adapted to dome stadiums," Waldrep says. "The technology is not the problem. It's applying that technology. It's the want to."

Halbrook has become such an expert on fields that the University of Oregon sought his advice on its new Omniturf football field. Halbrook is determined to see a hardness standard set for all athletic fields and knowledge of artificial turf become part of an athlete's training.

Their stories leave questions for our industry: Is the PAT system the answer? Who would set a hardness standard for schools, colleges, pros? How would it be enforced? Would it differ depending on a region's soil and turf? Will the liability crisis force some schools to eliminate athletics? Can turf be grown in dome stadiums? If not, can synthetic turf be made safer?

But these men and their families have their own question: Why does an industry's ignorance have to hurt anyone? Pain reflects in their eyes. Sometimes, anger flashes. But deep down is a strength which keeps them fighting to make fields safer.

The place to start is in our own backyard. Every field manager needs to evaluate the safety of his fields and make necessary changes. We need to do more than remember the stories of Scott Halbrook and Kent Waldrep, we must take responsibility for the safety of our athletes.

Images aren't enough.

Heide Aungst

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FALCON	6.8	7.7	6.9	6.6	4.8	6.2	7.3	6.4	5.1	6.4
OLYMPIC	6.9	8.1	6.5	6.3	4.2	5.8	6.6	6.4	4.8	6.2
CLEMFINE	5.9	7.3	6.3	5.9	4.1	6.3	4.6	5.9	4.2	5.6
GALWAY	—	7.5	6.0	6.4	4.8	6.1	5.1	5.5	4.4	5.5
KY-31	5.5	6.8	6.3	5.2	4.1	5.9	3.6	5.4	5.0	5.3
ALTA	5.8	—	5.8	5.2	—	5.2	2.5	—	4.1	4.8
FAWN	—	5.8	5.5	5.1	3.4	4.5	2.1	—	3.9	4.3
GOAR	—	4.7	5.4	5.1	3.1	4.7	1.6	3.0	3.1	3.8

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